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Type and Figured Specimens of Fossil Vertebrates in the Collection of the University of Kansas Museum of Natural History Part II. Fossil Amphibians and Reptiles

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CONTENTS

INTRODUCTION

In 1982, part one (Fossil Fishes) of the Catalogue of Type and Figured Specimens of Fossil Vertebrates in the Collection of the University of Kansas Museum of Natural History was published. Part two (Amphibians and Reptiles) follows the same scheme. It includes type and figured fossil herpetological specimens regardless of whether or not they were relocated. Each cited specimen is accompanied by the following information: currently used catalogue number and old number if cited in publication; name as published (the term "error" after a cited name indicates either misspelling in publication or variance from spelling of name used in the catalogue); author and year of publication (we were not able to cite all editions of text-books and popular books, however, an effort was made to cite the first edition in all cases); page of type description; figure; preserved anatomical part(s) of specimen; geologic stage, formation, member (see Zeller 1968); locality and collector (where known). Within the Cretaceous, the specificity of assignments to geologic stage varies for old localities depending on our knowledge of each locality. A locality can be assigned to stage if its location is well enough defined, because the areal distribution of outcrops correlated with various stages is known. Within one species, the specimens are arranged first after their type category and second in order of the appearance of the figures within the publication.

Every specimen is cited under the species to which it is assigned in the latest available publication, except where otherwise noted. Species are grouped according to the following classification:

Class Amphibia
- Subclass Lepospondyli
  - Order Nectridea
    - Family Urocordylidae
- Subclass Labyrinthodontia
  - Order Temnospondyli
    - Suborder Rhachitomi
      - Superfamily Trimerorhachoidea
        - Family Saurerpetontidae
      - Superfamily Eryopoidea
        - Family Eryopidae
      - Superfamily Dissorophoidea
        - Family Dissorophidae
    - Suborder Stereospondyli
      - Superfamily Capitosauroidea
        - Family Capitosauridae
  - Order Batrachosauria
  - Order Microsauria
    - Suborder Tuditanomorpha
      - Family Gymnarthridae
- Subclass Lissamphibia
  - Order Anura
    - Family Pelobatidae
    - Family Bufonidae
    - Family Ranidae
  - Order Urodela
    - Suborder Cryptobranchoidea
      - Family Cryptobranchidae
      - Family Ambystomatidae

Cohort Amniota

Class "Reptilia" (excluding Aves and Mammalia)
- Subclass Captorhinomorpha
  - Suborder Captorhinoidea
    - Family Captorhinidae
- Subclass Testudines
  - Order Casichelydia
    - Suborder Cryptodira
      - Superfamily Chelonioidea
        - Family Protostegidae
        - Family Toxochelyidae
        - Family Cheloniidae
      - Superfamily Testudinoidea
        - Family Chelydridae
        - Family Emydidae
        - Family Testudinidae
- Subclass Sauropsida
  - Superorder Lepidosauria
    - Order "Eosuchia"
      - Family Petrolacosauridae
    - Order Squamata
      - Suborder Sauria
      - Infraorder Iguania
        - Family Iguanidae
      - Infraorder Scincomorpha
        - Family Scincidae
        - Family Teiidae
      - Infraorder Anguimorpha
      - Superfamily Diploglossa
        - Family Anguidae
      - Superfamily Platynota

- Family Helodermatidae
- Family Mosasauridae
- Suborder Serpentes
- Suborder Amphisbaenia
- Family Amphisbaenidae

Superorder Archosauria
- Order Thecodontia
  - Suborder Pseudosuchia
  - Infraorder Parasuchia
    - Family Parasuchidae
- Order Crocodylia
  - Suborder Mesosuchia
    - Family Goniopholididae
- Order Pterosauria
  - Suborder Pterodactyloidea
    - Family Pteranodontidae
- Order Saurischia
  - Suborder Sauropodomorpha
  - Infraorder Sauropoda
    - Family Camarasauridae
    - Family Atlantosauridae
  - Suborder Theropoda
  - Infraorder Carnosauria
    - Family Megalosauridae
- Order Ornithischia
  - Suborder Ankylosauria
    - Family Nodosauridae
  - Suborder Ceratopsia
    - Family Ceratopsidae

Superorder Euryapsida
- Order Sauropterygia
  - Suborder Plesiosauria
  - Superfamily Plesiosauroidea
    - Family Elasmosauridae
  - Superfamily Pliosauroidea
    - Family Polycotylidae

Subclass Theropsida
- Order Pelycosauria
  - Suborder Sphenacodontia
    - Family Sphenacodontidae
  - Suborder Edaphosauria
    - Family Nitosauridae
    - Family Edaphosauridae

The classification follows Romer (1966) and Kuhn-Schnyder (1980) with the following changes: The Microsauria are excluded from the Lepospondyli because of their vertebral structure (Carroll and Gaskill 1978). The term Batrachosauria is used in the sense of Panchen (1977, 1980) replacing Anthracosauria. The terms "Reptilia" and "Archosauria" are used in the conventional way without including birds and mammals. The classification of Gaffney (1975) is adopted for the turtles. The order "Eosuchia" is retained for want of a better place to put *Petrolacosaurus* (Peabody 1952, Reisz 1977). "Eosuchia" is not a monophyletic group (Reisz 1981). The classification of Thecodontia is that of Chatterjee (1982), thus the phytosaurs (Parasuchidae) have been placed within the order Pseudosuchia.

SHORT HISTORY OF THE COLLECTION

A short history of the fossil vertebrate collection as a whole is given in Part I (Schultze et al. 1982), therefore this discussion is restricted solely to the acquisition of fossil amphibians and reptiles. In this connection, we can distinguish three active periods of publication, each connected with the collection of one of the following people: 1) S. W. Williston (1890-1902); 2) C. W. Hibbard (1928-1946); 3) F. E. Peabody (1948-1955).

Before S. W. Williston joined the faculty of the University of Kansas, F. H. Snow was active in collecting and acquiring fossils for the University of Kansas. The fates of these early specimens cannot always be determined. We do not know how many of the "41 saurians, 6 pterodactyles and 117 fishes" (Snow 1880) from the collecting parties of 1877 and 1878 are still in the collection; only a few specimens in our collection are definitely known to have been collected in those years. At an even earlier date the University of Kansas acquired an amphibian track way from the Upper Pennsylvanian of eastern Kansas that was collected by B. F. Mudge in 1873 and is now on exhibit. The type specimen of the plesiosaur *Trinacromerum anonymum* was also collected by B. F. Mudge in 1873. The acquisition date is unknown for these specimens, as it is for the oldest type specimen in the collection, *Plesiosaurus gulo*. The latter specimen belonged to the private collector Mr. J. Savage, Leavenworth, Kansas, when Cope (1872) reported on it at a meeting of the Academy of Natural Sciences, Philadelphia. E. D. Cope (1886, 1889) described

another type in the collection, a series of dermal ossicles and a single phalangeal element of *Geochelone orthopygia*, which he assigned to a new species of armadillo, *Caryoderma snovianum*.

During his stay at the University of Kansas (1890-1902), S. W. Williston directed many active students and collectors: G. R. Allman, E. H. S. Bailey, J. W. Beede, Barnum Brown, E. C. Case, B. M. Dickinson, L. L. Dyche, C. N. Gould, R. C. Gowell, J. B. Hatcher, B. H. Hill, G. Jewett, H. Kahl, V. L. Kellogg, W. C. Knight, W. T. Lee, W. N. Logan, H. T. Martin, T. Morse, T. R. Overton, A. T. Osborn, S. Prentice, E. S. Riggs, J. P. Sams, E. H. Sellards, E. E. Slosson, W. Snow, C. H. Sternberg, A. Stewart, E. P. West. They collected mostly in the Upper Cretaceous of western Kansas, and in the Upper Jurassic of Wyoming, but also in the Paleozoic of eastern Kansas. This was the period of most rapid growth of the fossil herpetological collection, especially that part from the Upper Cretaceous of western Kansas.

Collecting slowed after Williston left in 1902, but the years 1910 and 1911 were notable exceptions with collecting in the Upper Cretaceous of western Kansas and in the Oligocene-Miocene of Colorado by large field parties (C. E. McClung and H. T. Martin with W. Bailey, C. Fairchild, R. E. Fox, W. Green, H. Gunthorp, J. Henshall, R. Kimball, Lindsay, P. McArdle, H. Martin, R. L. Moodie, T. Morse, A. T. Osborn, G. Sternberg, E. H. Taylor).

C. W. Hibbard's field activities (1928-1946) focused on the Pliocene in Meade County, western Kansas. He was chiefly interested in small mammals, but at the same time he and his field crews collected an immense amount of isolated amphibian and reptile bones from deposits in western Kansas. His assistants were students and colleagues: B. P. Bagrowski, W. J. Baumgartner, M. Bear, C. D. Bunker, R. R. Camp, V. L. Carter, H. Cochran, L. Coghill, W. Dalquest, T. Downs, D. H. Dunkle, L. Eisley, M. K. Elias, H. Firner, V. Frechel, J. Frye, E. C. Galbreath, A. Graffham, B. George, M. Green, E. R. Hall, B. Hall, C. J. Hesse, J. E. Hill, H. Hildebrand, F. J. Holden, W. H. Hon, H. Jacob, M. Jewett, J. Kennedy, R. P. Keroker, W. Lane, B. Leonard, S. Lohman, T. McLaughlin, V. Mahon, M. Maldonado, D. Mallott, T. Moojen, W. K. McNown, F. Parks, M. Potter, E. S. Riggs, G. C. Rinker, R. Rinker, H. Setzer, H. T. U. Smith, L. H. Sprague, Stavely, F. Studer, E. H. and R. Taylor, J. Tihen, O. Tiemiere, J. Twente, C. C. Williams and W. Yost. E. H. Taylor based many new species on this isolated material, most of which were later synonymized by J. Tihen.

F. E. Peabody (1948-1955) was a member of the Department of Zoology, and he could obtain museum support only by working jointly with R. W. Wilson, the successor to C. W. Hibbard as curator of the collection of fossil vertebrates. Wilson was thus actively involved in collecting in the Permian of Fort Sill, Oklahoma (1950), and in the Pennsylvanian of Garnett, Kansas (1953, 1954). Other workers at Garnett were V. Hogg, D. Horr, N. Hotton III, R. Weeks and two neighbors of the quarry, E. Gates and W. Slocum. After Peabody left the University of Kansas in 1955, R. R. Camp continued the excavation at Garnett in 1955. N. Hotton III, a member of the Department of Anatomy, was another vertebrate paleontologist at the University of Kansas interested in Paleozoic amphibians and reptiles. He described *Acroplous* from the Speiser Shale at Keats, a locality discovered in the 1930's by M. Jewett. Hotton surveyed the exposures of the Speiser Shale, Lower Permian, throughout Kansas as described by Hattin (1957). Since then, the Speiser Shale exposures found continued interest. O. Bonner and L. D. Martin reopened the quarry at Keats in 1971, and in the following years O. Bonner and S. Dart (1972), and R. W. Coldiron (1974) continued to collect there and at other localities. B. Foreman was active throughout 1976-1980 in the Speiser Shale at a new locality: Eskridge, Wabaunsee County, Kansas; and in 1980 H.-P. Schultze began a study of fossil vertebrates of the Speiser Shale. It was then that D. Kirkpatrick discovered another locality rich in amphibians and lungfishes (near Junction City). Another Paleozoic locality (near Robinson, northeastern Kansas), known

since the 1890's was relocated by L. D. Martin and O. Bonner in 1974, and recollected by J. Chorn 1974-1979 with the help of K. Whetstone, C. Conley and H.-P. Schultze.

Collecting in the Upper Cretaceous of western Kansas has continued since O. Bonner joined the Museum staff in 1968. Bonner also made important new collections of Kiowa Shale vertebrates from the Lower Cretaceous. L. D. Martin and E. Wiley participated in collecting the Kansas Cretaceous, and L. D. Martin led parties into the Pierre Shale Cretaceous of Wyoming and South Dakota. Numerous students assisted in collecting the Cretaceous; the most notable being J. D. Stewart who collected widely in the Niobrara Chalk. Others include: D. Bennett, M. Bonner, J. Chorn, D. Frailey, B. Foreman, J. Harrison, J. Junge, D. and P. Kopsick, M. Neuner, P. Overton, D. Nixon, G. Parker, E. Rickart, T. Setoguchi, B. Stein, and K. Whetstone. Reptile (and other significant specimens) material from the Niobrara Chalk was also obtained from Marion Bonner.

In conclusion, the amphibians and reptiles from the Upper Pennsylvanian and Permian of eastern Kansas and reptiles from the Upper Cretaceous of western Kansas are the most significant parts of the fossil herpetological collection at the University of Kansas. The Pliocene amphibians widen the scope into the Cenozoic. The collection includes 72 holotypes, 11 paratypes, 32 syntypes, and 361 figured specimens; of those 2 holotypes, 3 paratypes, 18 syntypes, and 53 figured specimens could not be relocated. Fifty-five holotypes, and 9 paratypes characterize species still considered valid; 17 holotypes, and 2 paratypes have been synonymized. Eighteen holotypes represent the type-species of their genus.

Abbreviations used in text are as follow: AMNH, American Museum of Natural History; KUVP, Museum of Natural History, University of Kansas; MCZ, Museum of Comparative Zoology, Harvard University.

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We wish to express our thanks for help in various matters to O. Bonner, L. D. Martin, J. D. Stewart, and R. W. Wilson, all at the Museum of Natural History, University of Kansas, Lawrence, and to B. Foreman, Independence, Kansas. J. D. Stewart helped in assigning the Cretaceous localities to stage. We are especially grateful to Jan Elder and Coletta Spencer of the word processing service of the Division of Biology for their patience in typing a difficult manuscript.

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CATALOGUE

CLASS AMPHIBIA Linnaeus 1758
Subclass Lepospondyli Zittel 1888
Order Nectridea Miall 1875
Family Urocordylidae Lydekker 1890
Crossotelos Case 1911
Crossotelos annulatus Case 1911
(Type-species)
Trimerorhachis leptorhynchus Case 1902 *(nomen oblitum)*

Case described *Trimerorhachis leptorhynchus* in 1902 but in 1911B dropped the taxon as indeterminate, suggesting that it might belong to the cricotid anthracosaur *Cricotillus* Case 1902. Williston (1910A) suggested that *Cricotillus brachydens* Case was indistinct from the nectridean *Crossotelos*. Panchen (1970) and Olson (1967) both considered *Cricotillus brachydens* Case and *Trimerorhachis leptorhynchus* Case to be the same species, and Panchen (1970) placed *Cricotillus brachydens* Case in the order Batrachosauria, suborder Anthracosauria, *incertae sedis*. Olson (1970) considered *Trimerorhachis leptorhynchus* Case to be a *nomen oblitum*, but also considered *Cricotillus brachydens* Case to be closely related to the nectridean *Diplocaulus*, not *Crossotelos* as Williston (1910A) had thought. Olson retained *Cricotillus brachydens* Case in the Cricotidae. Milner (1978) followed Olson's conclusions on *Trimerorhachis leptorhynchus*, but considered *Cricotillus brachydens* Case to be a subjective junior synonym of the urocordylid nectridean *Crossotelos annulatus*.

KUVP 350 *Trimerorhachis leptorhynchus* sp. nov.—Case 1902: p. 64, no figs; holotype.
Trimerorhachis leptorhynchus Case—Olson 1970: text-fig. 1A-E; pl. 1A-B.
Partial skull.
Lower Permian, Wichita Group, Wellington Formation; two miles northeast of Orlando, SE¼, Sec. 31, T20N, R1W, Noble County, Oklahoma; collected by G. W. Stevens.

Cricotillus Case 1902
Cricotillus brachydens Case 1902
(Type-species)

KUVP 349 *Cricotillus brachydens* g. et sp. nov.—Case 1902: p. 63, no figs; holotype.
Cricotillus brachydens Case—Case 1911B: text-fig. 20.
Cricotillus brachydens Case—Olson 1970: text-fig. 1F; pl. 1C-D.
Cricotillus brachydens Case—Milner 1978: text-fig. 6A-B; based on figures and information given by Olson (1970).
Fragments of rostrum, including parts of the maxillaries, nasals, and vomers.
Lower Permian, Wichita Group, Wellington Formation; two miles northeast of Orlando, SE¼, Sec. 31, T20N, R1W, Noble County, Oklahoma; collected by G. W. Stevens.

Subclass Labyrinthodontia Owen 1860
Order Temnospondyli Zittel 1888
Suborder Rhachitomi Cope 1882
Superfamily Trimerorhachoidea Case 1946
Family Saurerpetontidae Chase 1965

Acroplous Hotton 1959
Acroplous vorax Hotton 1959
(Type-species)

KUVP 9822 *Acroplous vorax* n. sp.—Hotton 1959: p. 164, pl. 28, text-fig. 1-5; holotype; skull, mandible, vertebrae, limb elements, pectoral and pelvic girdles.

Lower Permian, Council Grove Group, Speiser Shale Formation; NW¼, SE¼, Sec. 36, T9S, R6E, Riley County, Kansas; Kitten Creek, just east of Keats, approximately 100 feet north of old U.S. Highway 24; collected by Mark Jewett in 1938.

KUVP 28352 *Acroplous vorax* Hotton—Coldiron 1978: text-figs. 1-3, 4A-B; disarticulated specimen in situ, including skull roof, occiput, partial parasphenoid, vertebrae, and scales.

Collected from the type locality by L. Martin and O. Bonner in 1971.

KUVP 49532 *Acroplous*—Bennett 1984: text-fig. 79; complete skull with interclavicle.

Lower Permian, Council Grove Group, Speiser Shale Formation; SE¼, Sec. 36, T13S, R11E, Wabaunsee County, Kansas; approximately 1.5 miles northwest of Eskridge on State Highway 99; roadcut on north side; from mudstone above red shale; collected by Brian Foreman in 1978.

Superfamily Eryopoidea Romer 1947
Family Eryopidae Cope 1882
Eryops Cope 1877
Eryops megacephalus Cope 1877

KUVP 348 *Eryops megacephalus* Cope—Williston 1899B: pl. 27, consists of figures of right scapulo-coracoid (inside view), which was erroneously cited as the left scapulo-coracoid, and a single tooth. Both figures are reversed. The tooth is figured as isolated but actual specimen is still in matrix. Plate 29; right scapulo-coracoid (outside view), erroneously cited as left scapulo-coracoid; figure is reversed. Plate 30, fig. 1, right mandible; erroneously cited as left mandible; figure is reversed. Plate 30, figs. 2,2a, listed as undetermined bones (identified by Moodie (1910) as the right clavicle). Orientation of both figures is correct.

Eryops willistoni, new species—Moodie 1910: p. 243, pl. 49, figs. 1-5; pls. 50-52, pl. 53, figs. 1-8; holotype; parts of skull, right mandible, single maxillary tooth, forelimbs and pectoral girdle, vertebrae, and single rib. Figures 1 and 2 of pl. 49; pls. 50-51; and figures 1 and 2 of pl. 53 are based on the same material illustrated in Williston (1899B). Image orientation of all figures is correct.

Lower Permian, Wichita Group, Wellington Formation, McCann Sandstone; McCann quarry (earlier Nardin site, or Eddy site), on Deer Creek, 8 miles west and 4 miles south of Blackwell and 2.5 miles northeast of Eddy, NE¼, Sec. 16, and SW¼, Sec. 9, T26N, R2W, Kay County, Oklahoma; collected by C. N. Gould in 1897.

Olson (1967) considered this species a synonym of *E. megacephalus* Cope.

Superfamily Dissorophoidea Bolt 1969
Family Dissorophidae Boulenger 1902
Arkanserpeton Lane 1932
Arkanserpeton arcuatum Lane 1932
(Type-species)

KUVP 5962 *Arkanserpeton arcuatum* genus et species nov.—Lane 1932: p. 315, pls.

26A-C; holotype; femur. This specimen was originally published as KUVP 1430.

Upper Pennsylvanian, Allegheny Formation, a bed of semianthracite coal within the Paris Shale; Eureka Mine, about one mile west of Paris, Logan County, Arkansas. This specimen was originally cited by Lane (1932) as KUVP 1430. The same number was later assigned to the holotype of *Scaphiopus pliobatrachus* Taylor 1937. The holotype of *Arkanserpeton arcuatum* Lane was later renumbered as KUVP 5962, while the holotype of *Scaphiopus pliobatrachus* Taylor remained as KUVP 1430.

Actiobates Eaton 1973
Actiobates peabodyi Eaton 1973
(Type-species)

KUVP 17941 *Actiobates peabodyi* new species—Eaton 1973: p. 2, text-fig. 1; holotype; skull and skeleton.

Upper Pennsylvanian, Missourian, Stanton Limestone Formation, Rock Lake Shale Member; approximately six miles northwest of Garnett, NW¼, NW¼, NE¼, Sec. 5, T20S, R19E, Anderson County, Kansas.

Suborder Stereospondyli Zittel 1888
Superfamily Capitosauroidea Säve-Söderbergh 1935
Family Capitosauridae Säve-Söderberg 1935
Mastodonsaurus Jaeger 1828

KUVP ? cf. *Mastodonsaurus* sp. indet.—Williston 1897F: pl. 21; single tooth; no KU number assigned; specimen not relocated.

Lower Permian (cited as Upper Carboniferous); near Louisville, Pottawatomie County, Kansas; collected by Herbert Bailey in 1897.

Eoscopus Daly 1976, *nomen nudum*
Eoscopus lockardi Daly 1976, *nomen nudum*
(Type-species)

Eoscopus lockardi—Daly 1976: p. 100. Material in the collections of the Museum of Natural History, The University of Kansas, Lawrence, and in the collections of the Geological Department, Kansas State University, Emporia.

Upper Pennsylvanian, Virgilian, Shawnee Group, Topeka limestone; quarry two miles east of Hamilton, SE¼, Sec. 5, T24S, R12E, Greenwood County, Kansas.

Daly (1976) cited distinguishing characters of a new unarmored dissorophoid, nevertheless the new name *Eoscopus lockardi* is not available because no figure (International Code Zoological Nomenclature, General Recommendations App. E17) and no type specimen is given (International Code Zoological Nomenclature, Art. 72).

Order Batrachosauria Efremov 1946, *incertae sedis*
Batrachosauria *incertae sedis*
Hesperoherpeton Peabody 1958

Peabody (1958) initially placed the genus *Hesperoherpeton* in the order Anthracosauria, family Cricotidae. Eaton and Stewart (1960) erected a new order (Plesiopoda) and family (Hesperoherpetonidae), based on more material. Romer (1966) did not follow Eaton and Stewart's conclusions and placed *Hesperoherpeton* in the order Anthracosauria, suborder ?Seymouriamorpha, *incertae sedis*. In placing *Hesperoherpeton* in the

order Batrachosauria, *incertae sedis*, without family designation, we follow Kuhn (1972).

Hesperoherpeton garnettense Peabody 1958
(Type-species)

KUVP 9976 *Hesperoherpeton garnettense* n. gen. and n. sp.—Peabody 1958: p. 571, text-fig. 1; holotype.

Hesperoherpeton garnettense Peabody—Eaton and Stewart 1960: text-fig. 8.

Right scapulo-coracoid and neural arch.

Upper Pennsylvanian, Missourian, Stanton Limestone Formation; Hardesty Farm, approximately six miles northwest of Garnett, NW¼, NW¼, NE¼, Sec. 5, T20S, R19E, Anderson County, Kansas; collected by F. E. Peabody in 1954.

KUVP 10295 *Hesperoherpeton garnettense* Peabody—Eaton and Stewart 1960: text-figs. 1-7 and 9-11.

Hesperoherpeton—Szarski 1962: text-figs. 36 and 37; text-fig. 38 (after text-figs. 4, 2 and 11 in Eaton and Stewart 1960).

Hesperoherpeton—Eaton 1962: text-fig. 3A (after text-fig. 11 in Eaton and Stewart 1960).

Hesperoherpeton garnettense Peabody—Tatarinov, L. P. 1964A: text-fig. 100a-g (after text-figs. 1, 2, 4, 5a, 7c, 7b, 11 respectively in Eaton and Stewart 1960).

Hesperoherpeton garnettense Peabody—Kuhn 1965: text-fig. 16 (after figs. 1 and 4 in Eaton and Stewart 1960).

Hesperoherpeton garnettense Peabody—Kuhn 1972: text-figs. 20.7-20.8, (after text-figs. 1 and 4 in Eaton and Stewart 1960).

Various cranial elements, right mandible, vertebrae, right scapulo-coracoid, right clavicle, left forelimb. Collected from the type locality by R. R. Camp in 1955.

Order Microsauria Dawson 1863
Suborder Tuditanomorpha Carroll and Gaskill 1978
Family Gymnarthridae Case 1910
Euryodus Olson 1939
Euryodus peabodyi (Carroll and Gaskill) 1978

Carroll and Gaskill (1978) determined that material previously referred to as *Cardiocephalus* cf. *sternbergi* by Gregory et al. (1956), from Fort Sill, Oklahoma, actually represented a new species, *Cardiocephalus peabodyi*. Schultze and Foreman (1981), in a review of the tuditanomorph microsaurs, synonymized *Cardiocephalus peabodyi* into the genus *Euryodus*.

KUVP 8967 *Cardiocephalus* cf. *sternbergi*—Gregory et al. 1956: text-figs. 8A-D; nearly complete skull with jaws.

Lower Permian, Wichita Group, Wellington Formation, fissure fills within the Ordovician Arbuckle Limestone; Dolese Brothers limestone quarry at Richards Spur, just west of U.S. Hwys. 62 and 281, 10.5 miles south of Apache, 6 miles north of Fort Sill, SW½, Sec. 31, T4N, R11W, Comanche County, Oklahoma; collected by F. E. Peabody in 1950.

Euryodus sp.

KUVP 9923 *Cardiocephalus* cf. *sternbergi*—Gregory et al. 1956: text-figs. 8E-G; isolated left lower jaw.

KUVP 9928 *Cardiocephalus* cf. *sternbergi*—Gregory et al. 1956: text-figs. 16E-G; isolated occipital-basioccipital complex.

KUVP 9929 *Cardiocephalus* sp.—Gregory et al. 1956: text-fig. 22; scapulo-coracoid.
KUVP 9930 *Cardiocephalus* sp.—Gregory et al. 1956: text-fig. 22; scapulo-coracoid.
KUVP 9931 *Cardiocephalus* sp.—Gregory et al. 1956: text-fig. 22; ischium.
KUVP 9932 *Cardiocephalus* sp.—Gregory et al. 1956: text-fig. 22; sacral rib.
KUVP 9933 *Cardiocephalus* sp.—Gregory et al. 1956: text-fig. 23; pelvis.
KUVP 9934 *Cardiocephalus* sp.—Gregory et al. 1956: text-fig. 23; pelvis.
KUVP 9923, 9928-34 Lower Permian, Wichita Group, Wellington Formation, fissure fills within the Arbuckle Limestone; Dolese Brothers limestone quarry at Richards Spur, just west of U.S. Hwys. 62 and 281, 10.5 miles south of Apache, 6 miles north of Fort Sill, SW¼, Sec. 31, T4N, R11W, Comanche County, Oklahoma; collected by F. E. Peabody in 1950.

Euryodus primus Olson 1939

KUVP 9922 *Euryodus primus* Olson—Gregory et al. 1956: text-fig. 14; isolated lower jaw. Specimen not relocated.
KUVP 9926 *Euryodus primus* Olson—Gregory et al. 1956: text-fig. 16B-D; isolated atlas.
KUVP 9936 *Euryodus primus* Olson—Gregory et al. 1956: text-fig. 15; sections of dentary teeth.
KUVP 9922, 9926, 9936 Lower Permian, Wichita Group, Wellington Formation, fissure fills within the Ordovician Arbuckle Limestone; Dolese Brothers limestone quarry at Richards Spur, just west of U.S. Hwys. 62 and 281, 10.5 miles south of Apache, 6 miles north of Fort Sill, SW¼, Sec. 31, T4N, R11W, Comanche County, Oklahoma; collected by F. E. Peabody in 1950.

Euryodus bonneri Schultze and Foreman 1981

KUVP 47367 *Euryodus bonneri* n. sp.—Schultze and Foreman 1981: p. 3, text-figs. 1, 2; holotype; nearly complete, articulated skull with jaws, vertebrae, and humerus.
Lower Permian, Middle Wolfcampian, Council Grove Group, Lower Speiser Shale Formation; road-cut on Kansas State Highway 99, 1.5 miles northwest of Eskridge, SE¼, Sec. 36, T13S, R11E, Wabaunsee County, Kansas; collected by Brian Foreman in 1976.

Labyrinthodontia *incertae sedis*

KUVP 24002 Unidentified labyrinthodont—Bolt 1974: text-fig. 1; left vomer, (erroneously described as a right palatine).
Unidentified labyrinthodont—Schultze and Chorn 1983: fig. 1a-c; left vomer.
KUVP 65042 Unidentified labyrinthodont—Schultze and Chorn 1983: figs. 2, 3a-c; left vomer.
Lower Permian, Wichita Group, Wellington Formation, fissure fills within the Ordovician Arbuckle Limestone; Dolese Brothers limestone quarry, at Richards Spur (Ft. Sill), SW¼, Sec. 31, T4N, R11W, Comanche County, Oklahoma.
KUVP 82697 Labyrinthodont ?intercentrum—Schultze 1985: text-fig. 8.3.
Lower Permian, Gearyan, Council Grove Group, Upper Speiser Shale Formation; road cut on KS Hwy. 38, SE¼, SE¼, Sec. 20, T32S, R7E, Cowley County, Kansas.

Subclass Lissamphibia Haeckel 1866
Order Anura Laurenti 1768
Family Pelobatidae Stannius 1856

Scaphiopus Holbrook 1836

Scaphiopus pliobatrachus Taylor 1937

KUVP 1430 *Scaphiopus pliobatrachus* sp. nov.—Taylor 1937: p. 515, pl. 1, fig. 1; holotype.

Scaphiopus pliobatrachus Taylor—Taylor 1941B: text-fig. 1A-B; coccyx with fused sacral vertebrae.

KUVP 1434 *Scaphiopus pliobatrachus* Taylor—Taylor 1941B: text-fig. 3A; fragment of radio-ulna.

KUVP 1432 *Scaphiopus pliobatrachus* Taylor—Taylor 1941B: text-fig. 3B; fragment of humerus.

KUVP 1436 *Scaphiopus pliobatrachus* Taylor—Taylor 1941B: text-fig. 3C; fragment of ilium.

KUVP 1431 *Scaphiopus pliobatrachus* Taylor—Taylor 1941B: text-fig. 3D-E; fragment of humerus.

KUVP 1433 *Scaphiopus pliobatrachus* Taylor—Taylor 1941B: text-fig. 3F; fragment of radio-ulna.

KUVP 1430-1434, 1436 Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); Edson Quarry, SW1/4, Sec. 25, T10S, R38W, Sherman County, Kansas; collected by H. T. Martin and C. W. Hibbard in 1928.

KUVP 1469 *Scaphiopus antiquus* n. sp.—Taylor 1941B: p. 184, text-fig. 2; holotype; coccyx with fused sacral vetebrae.

Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); Edson Quarry, SW1/4, Sec. 25, T10S, R38W, Sherman County, Kansas; collected by D. Dunkle and E. H. Taylor in 1935.

Tihen (1960) considered *Scaphiopus antiquus* Taylor to be a synonym of *Scaphiopus pliobatrachus* Taylor.

Scaphiopus studeri Taylor 1938

KUVP 1478 *Scaphiopus studeri* sp. nov.—Taylor 1938: p. 408, pls. 42–43; pl. 44, figs. 2, 4–6, 8, 10, 12–14; pl. 45, figs. 2-3, 6, 10-13; holotype.

Scaphiopus studeri Taylor—Lane 1945B: text-fig. 7 (after pl. 42 in Taylor 1938).

Scaphiopus—Bennett 1984: text-fig. 81 (after pl. 42 in Taylor 1938).

Skull and skeleton, part and counterpart.

Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); about one mile east of "Rhino Hill Quarry," near Wallace County line, Sec. 7, T11S, R37W, Logan County, Kansas; collected by Frank Studer in 1934.

Scaphiopus diversus Taylor 1942

KUVP 6368 *Scaphiopus diversus* n. sp.—Taylor 1942: p. 202, pl. 15, fig. 2A-B; holotype; portion of combined sacral vertebrae and coccyx.

Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); about 16 miles southwest of Meade, NE1/4, SW1/4, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

KUVP 6367 *Neoscaphiopus noblei* n. gen. et n. sp.—Taylor 1942: p. 204, pl. 15, fig. 5A-B; holotype, portion of combined sacral vertebrae and coccyx.

Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); about 16 miles southwest of Meade, NE1/4, SW1/4, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Tihen (1960) considered *Neoscaphiopus noblei* Taylor to be a synonym of *Scaphiopus diversus* Taylor.

Family Bufonidae Fitzinger 1826

Bufo Laurenti 1768

Bufo hibbardi Taylor 1937

KUVP 1437 *Bufo hibbardi* sp. nov.—Taylor 1937: p. 517, pl. 1, fig. 3; holotype.
Bufo hibbardi Taylor—Taylor 1941B: text-fig. 5; erroneously cited as KUVP 1472.
Bufo hibbardi Taylor—Tihen 1962: text-fig. 62 (after text-fig. 5 in Taylor 1941).
Sacral vertebra.

KUVP 1446 *Bufo hibbardi* sp. nov.—Taylor 1937: pl. 1, fig. 4; fragment of urostyle.

KUVP ? *Bufo hibbardi* ? sp. nov.—Taylor 1937: pl. 1, fig. 5; sacral vertebra. Published as KUVP 1466a. Specimen not relocated.

KUVP 1438 *Bufo hibbardi* sp. nov.—Taylor 1937: pl. 1, fig. 6; scapula.

KUVP 1439 *Bufo hibbardi* sp. nov.—Taylor 1937: pl. 1, fig. 7; fragment of humerus.

KUVP 1440 *Bufo hibbardi* sp. nov.—Taylor 1937: pl. 1, fig. 8; fragment of radio-ulna.

KUVP 65019 *Bufo hibbardi* sp. nov.—Taylor 1937: pl. 1, fig. 9; fragment of radio-ulna. Published as KUVP 1440a.

KUVP 1449 *Bufo hibbardi* sp. nov.—Taylor 1937: pl. 2, fig. 3; fragment of ilium.

KUVP 1450 *Bufo hibbardi* sp. nov.—Taylor 1937: pl. 2, fig. 4; fragment of ilium. Specimen not relocated.

KUVP 1448 *Bufo hibbardi* sp. nov.—Taylor 1937: pl. 2, fig. 13; fragment of tibia-fibula. Specimen not relocated.

KUVP 1447 *Bufo hibbardi* sp. nov.—Taylor 1937: pl. 2, fig. 14; fragment of femur.

KUVP 6397 *Bufo hibbardi* Taylor—Tihen 1962: text-fig. 36; fragment of ilium.

KUVP 1452 *Bufo arenarius* sp. nov.—Taylor 1937: p. 521, pl. 1, fig. 2; holotype.
Bufo arenarius Taylor—Taylor 1941B: text-fig. 6A; erroneously cited as KUVP 1470.
Bufo arenarius Taylor—Tihen 1962: text-fig. 62 (after fig. 6A in Taylor 1941).
Sacral vertebra.

KUVP 1456 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 1, fig. 10; humerus.

KUVP 1458 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 1, fig. 11; scapula.

KUVP ? *Bufo arenarius* ? sp. nov.—Taylor 1937: pl. 1, fig. 12; fragment of scapula. Published as KUVP 1458a. Specimen not relocated.

KUVP 1455 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 1, fig. 13; humerus. Specimen not relocated.

KUVP 1457 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 1, fig. 14; radio-ulna. Specimen not relocated.

KUVP 1466 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 2, fig. 1; fragment of ilium.

KUVP 1465 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 2, fig. 2; fragment of ilium.

KUVP 1461 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 2, fig. 6; fragment of tibia-fibula.

KUVP 1464 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 2, fig. 7; fragment of tibia-fibula.

KUVP ? *Bufo arenarius* sp. nov.—Taylor 1937: pl. 2, fig. 9; fragment of tibia-fibula. Published as KUVP 1464c. Specimen not relocated.

KUVP 1460 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 2, fig. 10; fragment of femur.

KUVP ? *Bufo arenarius* sp. nov.—Taylor 1937: pl. 2, fig. 11; fragment of tibia-fibula. Published as KUVP 1459a. Specimen not relocated.

KUVP 1459 *Bufo arenarius* sp. nov.—Taylor 1937: pl. 2, fig. 12; fragment of femur.

KUVP 1437-40; 1446-50; 1455; 1457-61; 1464-66; 6397; 65019 Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); Edson Quarry, SW¼, Sec. 25, T10S, R38W, Sherman County, Kansas; collected by H. T. Martin and party in 1928.

KUVP 1474 *Bufo arenarius* Taylor—Taylor 1941B: fig. 6B; sacral vertebra; collected

at the type locality by E. H. Taylor and D. Dunkle in 1935.
Tihen (1962) considered *Bufo arenarius* Taylor to be a synonym of *Bufo hibbardi* Taylor.

Bufo sp.

KUVP ? *Bufo* sp.—Taylor 1937: pl. 2, fig. 5; fragment of tibia-fibula. Published as KUVP 1464a. Specimen not relocated.

KUVP ? *Bufo* sp.—Taylor 1937: pl. 2, fig. 8; fragment not identified. Published as KUVP 1464b. Specimen not relocated.

Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); Edson Quarry, SW¼, Sec. 25, T10S, R38W, Sherman County, Kansas; collected by H. T. Martin and party in 1928.

KUVP 6319 *Bufo* sp.?—Taylor 1942: pl. 17; figs. 10A-10B; coccyx.

KUVP 6334 *Bufo* sp.—Taylor 1942: pl. 19; fig. 12; ilium.

KUVP 6335 *Bufo* sp.—Taylor 1942: pl. 19; fig. 13; ilium.

KUVP 61319, 6334-35 Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); about 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Family Ranidae Bonaparte 1831

Rana Linnaeus 1758

Holman (1963) considered *Anchylorana* Taylor a synonym of *Rana* Linnaeus.

Rana dubita (Taylor) 1942

KUVP 6377 *Anchylorana dubita*, n. sp.—Taylor 1942: p. 209, pl. 15, fig. 4A-B; holotype sacrum.

Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Rana ephippium Taylor 1942

KUVP 6370 *Rana ephippium*, n. sp.—Taylor 1942: p. 214, pl. 14, fig. 1A-B; holotype; sacral vertebra with fragmentary diapophyses.

Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Rana fayeae Taylor 1942

KUVP 6378 *Rana fayeae*, n. sp.—Taylor 1942: p. 212, pl. 14, fig. 4A-B; holotype; nearly complete sacral vertebra.

Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Rana meadensis Taylor 1942

KUVP 6376 *Rana meadensis*, n. sp.—Taylor 1942: p. 213, pl. 14, fig. 5A-B; holotype; nearly complete sacral vertebra.

Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Rana moorei (Taylor 1942)

KUVP 6375 *Anchylorana moorei*, n. sp.—Taylor 1942: p. 208, pl. 15, fig. 3A-B; holotype; fragmentary sacrum.

Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1939.

Rana parvissima Taylor 1942

KUVP 6451 *Rana parvissima,* n. sp.—Taylor 1942: p. 217, pl. 16, fig. 2; holotype; fragment of a sacral centrum, with one coccygeal condyle and the right diapophysis present.
Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1941.

Rana rexroadensis Taylor 1942

KUVP 6369 *Rana rexroadensis,* n. sp.—Taylor 1942: p. 215, pl. 14, fig. 3A-B; holotype; sacral vertebra, missing diapophyses.
Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Rana robustocondyla (Taylor 1942)

KUVP 5106 *Anchylorana robustocondyla,* n. sp.—Taylor 1942: p. 211, pl. 15, fig. 1; holotype; sacral centrum and eighth vertebra.
Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1937.

Rana valida Taylor 1942

KUVP 5133 *Rana valida,* n. sp.—Taylor 1942: p. 216, pl. 14, fig. 2A-B; holotype; sacral vertebra, missing diapophyses.
Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Rana sp.

KUVP 6379 *Rana* sp.—Taylor 1942: pl. 16, fig. 1; sacral vertebra.
KUVP 6314 *Rana* sp.—Taylor 1942: pl. 16, fig. 11; humerus.
KUVP 5107 *Rana* sp.—Taylor 1942: pl. 16, fig. 12; tibio-fibula.
KUVP 65092 *Rana* sp.—Taylor 1942: pl. 16, fig. 13; femur. Cited as KUVP 5107A.
KUVP 6385 *Rana* sp.?—Taylor 1942: pl. 17, fig. 1A-1B; scapula. Half of this specimen is missing.
KUVP 5134 *Rana* sp.?—Taylor 1942: pl. 17, fig. 2A-2B; scapula.
KUVP 5105 *Rana* sp.?—Taylor 1942: pl. 17, fig. 3A-3B; scapula.
KUVP 5103 *Rana* sp.?—Taylor 1942: pl. 17, fig. 4; scapula.
KUVP 6364 *Rana* sp.—Taylor 1942: pl. 19, fig. 1; ilium. Specimen not relocated.
KUVP 6365 *Rana* sp.—Taylor 1942: pl. 19, fig. 2; ilium.
KUVP 6360 *Rana* sp.—Taylor 1942: pl. 19, fig. 3; ilium.
KUVP 5121 *Rana* sp.—Taylor 1942: pl. 19, fig. 4; ilium.
KUVP 6317 *Rana* sp.—Taylor 1942: pl. 19, fig. 5; ilium.
KUVP 6354 *Rana* sp.—Taylor 1942: pl. 19, fig. 6; ilium.
KUVP 6345 *Rana* sp.—Taylor 1942: pl. 19, fig. 7; ilium.
KUVP 6362 *Rana* sp.—Taylor 1942: pl. 19, fig. 8; ilium.
KUVP 65093 *Rana* sp.—Taylor 1942: pl. 19, fig. 9; ilium. Cited as KUVP 6364A.
KUVP 6349 *Rana* sp.—Taylor 1942: pl. 19, fig. 10; ilium.
KUVP 6310 *Rana* sp.—Taylor 1942: pl. 19, fig. 11; ilium.
KUVP 5103, 5105, 5107, 5121, 5134, 6310, 6314, 6317, 6345, 6349, 6354, 6365, 6379,

6385, 65092-3 Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Ranidae indeterminate (referable to *Anchylorana*)

KUVP 6327 Ranidae indet.—Taylor 1942: pl. 17, fig. 6A-6B; fragment of coccyx. Cited as, "probably referable to *Anchylorana*."
Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Ranidae indeterminate (referable to *Rana*)

KUVP 6328 Ranidae indet.—Taylor 1942: pl. 17, fig. 7A-7B; fragment of coccyx. Cited as, "probably referable to *Rana*."

KUVP 6323 Ranidae indet.—Taylor 1942: pl. 17, fig. 8A-8B; fragment of coccyx. Cited as, "probably referable to *Rana*."

KUVP 5088 Ranidae indet.—Taylor 1942: pl. 17, fig. 9A-9B; fragment of coccyx. Cited as, "probably referable to *Rana*."

KUVP 6383 Ranidae indet.—Taylor 1942: pl. 17, fig. 12A-12B; coccyx. Cited as, "probably referable to *Rana*."

KUVP 6318 Ranidae indet.—Taylor 1942: pl. 17, fig. 13A-13B; coccyx. Cited as, "probably referable to *Rana*."

KUVP 6325 Ranidae indet.—Taylor 1942: pl. 17, fig. 11A-11B; coccyx.

KUVP 5088, 6318, 6323, 6325, 6328, 6383 Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Anura indeterminate (referable to *Rana*)

KUVP 6306 Anura indet.—Taylor 1942: pl. 18, fig. 1; ilium. Cited as referable to *Rana*.

KUVP 6356 Anura indet.—Taylor 1942: pl. 18, fig. 2; ilium. Cited as referable to *Rana*.

KUVP 6371 Anura indet.—Taylor 1942: pl. 18, fig. 3; ilium. Cited as referable to *Rana*.

KUVP 6312 Anura indet.—Taylor 1942: pl. 18, fig. 4; ilium. Cited as referable to *Rana*.

KUVP 6352 Anura indet.—Taylor 1942: pl. 18, fig. 5; ilium. Cited as referable to *Rana*.

KUVP 6342 Anura indet.—Taylor 1942: pl. 18, fig. 6; ilium. Cited as referable to *Rana*.

KUVP 6355 Anura indet.—Taylor 1942: pl. 18, fig. 7; ilium. Cited as referable to *Rana*.

KUVP 6373 Anura indet.—Taylor 1942: pl. 18, fig. 8; ilium. Cited as referable to *Rana*.

KUVP 6372 Anura indet.—Taylor 1942: pl. 18, fig. 9; ilium. Cited as referable to *Rana*.

KUVP 6346 Anura indet.—Taylor 1942: pl. 18, fig. 10; ilium. Cited as referable to *Rana*.

KUVP 6311 Anura indet.—Taylor 1942: pl. 18, fig. 11; ilium. Cited as referable to *Rana*.

KUVP 6348 Anura indet.—Taylor 1942: pl. 18, fig. 12; ilium. Cited as referable to *Rana*.

KUVP 5086 Anura indet.—Taylor 1942: pl. 18, fig. 13; ilium. Cited as referable to *Rana*.

KUVP 6331 Anura indet.—Taylor 1942: pl. 18, fig. 14; ilium. Cited as referable to *Rana*.

KUVP 6307 Anura indet.—Taylor 1942: pl. 18, fig. 15; ilium. Cited as referable to *Rana*.

KUVP 6333 Anura indet.—Taylor 1942: pl. 18, fig. 16; ilium. Cited as referable to *Rana*.

KUVP 6315 Anura indet.—Taylor 1942: pl. 18, fig. 17; ilium. Cited as referable to *Rana*.

KUVP 6359 Anura indet.—Taylor 1942: pl. 18, fig. 18; ilium, Cited as referable to *Rana*.

KUVP 6340 Anura indet.—Taylor 1942: pl. 18, fig. 19; ilium. Cited as referable to *Rana*.

KUVP 6341 Anura indet.—Taylor 1942: pl. 18, fig. 20; ilium. Cited as referable to *Rana*.

KUVP 6353 Anura indet.—Taylor 1942: pl. 18, fig. 21; ilium. Cited as referable to *Rana*.

KUVP 6350 Anura indet.—Taylor 1942: pl. 18, fig. 22; ilium. Cited as referable to *Rana*.

KUVP 6358 Anura indet.—Taylor 1942: pl. 18, fig. 23; ilium. Cited as referable to *Rana*.

KUVP 6316 Anura indet.—Taylor 1942: pl. 20, fig. 1; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6336 Anura indet.—Taylor 1942: pl. 20, fig. 2; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6332 Anura indet.—Taylor 1942: pl. 20, fig. 3; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6339 Anura indet.—Taylor 1942: pl. 20, fig. 4; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6363 Anura indet.—Taylor 1942: pl. 20, fig. 5; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6357 Anura indet.—Taylor 1942: pl. 20, fig. 6; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6366 Anura indet.—Taylor 1942: pl. 20, fig. 7; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6337 Anura indet.—Taylor 1942: pl. 20, fig. 8, ilium. Cited as, "mostly referable to *Rana*."

?KUVP 6374 Anura indet.—Taylor 1942: pl. 20, fig. 9, ilium. Cited as, "mostly referable to *Rana*."

KUVP 6361 Anura indet.—Taylor 1942: pl. 20, fig. 10, ilium. Cited as, "mostly referable to *Rana*."

KUVP ? Anura indet.—Taylor 1942: pl. 20, fig. 11, ilium. Cited as, "mostly referable to *Rana*." Erroneously listed as KUVP 6309, as it does not match the figure. Specimen not relocated.

KUVP 6347 Anura indet.—Taylor 1942: pl. 20, fig. 12; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6309 Anura indet.—Taylor 1942: pl. 20, fig. 13; ilium. Cited as, "mostly referable to *Rana*."

KUVP ? Anura indet.—Taylor 1942: pl. 20, fig. 14; ilium. Cited as, "mostly referable to *Rana*." Originally listed as KUVP 6336A. Specimen not relocated.

KUVP 6351 Anura indet.—Taylor 1942: pl. 20, fig. 15; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6338 Anura indet.—Taylor 1942: pl. 20, fig. 16; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6344 Anura indet.—Taylor 1942: pl. 20, fig. 17; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6343 Anura indet.—Taylor 1942: pl. 20, fig. 18; ilium. Cited as, "mostly referable to *Rana*."

KUVP 6329 Anura indent.—Taylor 1942: pl. 20, fig. 19; ilium. Cited as, "mostly referable to *Rana*."

KUVP 5086, 6306-07, 6309, 6311-12, 6315-16, 6219, 6331-33, 6336-44, 6346-48, 6350-53, 6355-59, 6361, 6363, 6366, 6371-74, and all KUVP? Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Anura indeterminate

KUVP 6384 Anura indet.—Taylor 1942: pl. 16, fig. 3A,3B; parasphenoid.

KUVP 5096 Anura indet.—Taylor 1942: pl. 16, fig. 4A,4B; radio-ulna.

KUVP 6320 Anura indet.—Taylor 1942: pl. 16, fig. 5A,5B; radio-ulna.

KUVP 6322 Anura indet.—Taylor 1942: pl. 16, fig. 6A,6B; radio-ulna.

KUVP 6321 Anura indet.—Taylor 1942: pl. 16, fig. 7A,7B; radio-ulna.

KUVP 6324 Anura indet.—Taylor 1942: pl. 16, fig. 8A,8B; radio-ulna.

KUVP 6382 Anura indet.—Taylor 1942: pl. 16, fig. 9A,9B; radio-ulna.

KUVP 6381 Anura indet.—Taylor 1942: pl. 16, fig. 10A,10B; radio-ulna.

KUVP 6326 Anura indet.—Taylor 1942: pl. 17, fig. 5A,5B; fragment of coccyx.

KUVP 5096, 6320-22, 6324, 6326, 6381-82, 6384 Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Order Urodela Baur 1888
Suborder Cryptobranchoidea Dunn 1922
Family Cryptobranchidae Cope 1889
Andrias Tschudi 1837
Andrias matthewi (Cook 1917)

KUVP 12004d *Andrias matthewi*—Meszoely 1966: text-figs. 5a, 6b; trunk vertebra. Erroneously published as UK12004-c.

Andrias matthewi—Estes 1981: text-fig. 2d (redrawn from Meszoely 1966, text-figs. 5a, 6b).

Tertiary, Miocene, Pawnee Creek Formation (Hemingfordian land mammal age), Martin Canyon local fauna; "Quarry A," NE¼, Sec. 27, T11N, R53W, Logan County, Colorado.

Family Ambystomatidae Hallowell 1856
Ambystoma Tschudi 1838
Ambystoma kansensis (Adams 1929)

KUVP 5250 *Plioambystoma kansensis* gen. et sp. nov.—Adams, in Adams and Martin 1929: p. 505, no figs.; holotype.

Plioambystoma kansasenese (error)—Adams and Martin 1930: pl. 32.

Plioambystoma kansense (error)—Lane 1945B: text-fig. 6.

KUVP 5250 has been cited as the holotype, however it is a composite of disarticulated pieces. Single elements have been described and figured in

Adams and Martin (1929, 1930), but they are not the same elements used to reconstruct the skull or skeleton of the holotype. The paratypes designated by Adams in Adams and Martin (1929), KUVP 5251-53, have not been relocated. On this basis, the elements figured in the 1929 paper by Adams and Martin are considered syntypes. Composite skull and skeleton.

KUVP 65020 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 1; syntype; right premaxilla.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 2; syntype; left maxilla; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 3; syntype; right prefrontal; specimen not relocated.

KUVP 65021 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 4; syntype; left parietal.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 5; syntype; right squamosal; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 6; syntype; right frontal; specimen not relocated.

KUVP 65022 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 7; syntype; right orbitosphenoid.

KUVP 65023 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 8; syntype; left otic capsule.

KUVP 65024 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 9; syntype; left otic capsule.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 10; syntype; right stapes; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 11; syntype; right quadrate; specimen not relocated.

KUVP 65025 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929; text-fig. 12; syntype; left otic capsule.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 13; syntype; left quadrate; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 14; syntype; left maxillary teeth; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 15; syntype; left pterygoid; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 16; syntype; right dentary; specimen not relocated.

Ambystoma kansense (error)—Estes 1981: text-fig. 14d upper figure (after Adams and Martin 1929, text-fig. 16).

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 17; syntype; second basibranchial; specimen not relocated.

KUVP 65026 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 18; syntype; left angular.

Ambystoma kansense (error)—Estes 1981: text-fig. 14d lower figure (after Adams and Martin 1929, text-fig. 18).

KUVP 65027 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 19; syntype; sacral vertebra.

Ambystoma kansense (error)—Estes 1981: text-fig. 14e left (after Adams and Martin 1929, text-fig. 19).

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 20; syntype; left rib; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig.

21; syntype; parasphenoid; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 22; syntype; axis; specimen not relocated.
Ambystoma kansense (error)—Estes 1981: text-fig. 14e right (after Adams and Martin 1929, text-fig. 22).

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 23; syntype; sagittal section of body vertebra; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 24; syntype; third caudal vertebra; specimen not relocated.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 25; syntype; left scapulo-coracoid; specimen not relocated.

KUVP 65028 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 26; syntype; right humerus.

KUVP 65029 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 27; syntype; right radius and ulna; right ulna not relocated.

KUVP 65030 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 28; syntype; right fibula.

KUVP 65031 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 29; syntype; right tibia.

KUVP ? *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 30; syntype; right ilium; specimen not relocated.

KUVP 65032 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 31; syntype; ilium, ischium and sacral rib in position.

KUVP 65033 *Plioambystoma kansensis*—Adams, in Adams and Martin 1929: text-fig. 32; syntype; left femur.

KUVP 65034 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 1; right premaxilla.

KUVP 65035 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 2; right parietal.

KUVP 65036 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 3; right frontal.

KUVP 65037 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 4; right squamosal.

KUVP 65071 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 5; left pterygoid.

KUVP ? *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 6; right maxilla; specimen not relocated.

KUVP 65072 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 7; right orbitosphenoid.

KUVP 65073 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 8; right quadrate.

KUVP 65074 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 9; right prefrontal.

KUVP 65075 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 10; parasphenoid.

KUVP ? *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 11; axis; specimen not relocated.

KUVP 65076 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 12; body vertebra.

KUVP 65077 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 13; sacral vertebra.

KUVP 65078 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 14; left otic capsule.

KUVP 65079 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig.

15; caudal vertebra.

KUVP 65080 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 16; second basibranchial.

KUVP 65081 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 17; ilium.

KUVP 65082 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 18; ischium.

KUVP ? *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 19; left scapulo-coracoid; specimen not relocated.

KUVP 65083 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 20; left humerus.

KUVP ? *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 21; left ulna; specimen not relocated.

KUVP ? *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 22; left radius; specimen not relocated.

KUVP 65084 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 23; right femur.

KUVP 65085 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 24; right tibia.

KUVP 65086 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 25; left fibula.

KUVP 65087 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 26; dentary.

KUVP 65088 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 27; left rib.

KUVP ? *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 28; left rib; specimen not relocated.

KUVP 65089 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 29; left rib.

KUVP ? *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 30; right rib; specimen not relocated.

KUVP 65090 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 31; right rib.

KUVP 65091 *Plioambystoma kansasenese* (error)—Adams and Martin 1930: pl. 31, fig. 32; right sacral rib.

KUVP 5250; 65020-37; 65071-91; and all KUVP ?: Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); Edson Quarry, SW¼, Sec. 25, T10S, R38W, Sherman County, Kansas; collected by H. T. Martin and party in 1928.

Tihen (1958) considered the genus *Plioambystoma* Adams to be a synonym of *Ambystoma* Tschudi. Taylor (1941B), Lane (1945B) and Tihen (1958) erroneously listed the specific name of this taxon as *kansense,* rather than *kansensis.*

KUVP 1468 *Lanebatrachus martini* n. gen. and n. sp.—Taylor 1941B: p. 180, text-fig. 4A-B; holotype; portion of dentary and angular.

Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); Edson Quarry, SW¼, Sec. 25, T10S, R38W, Sherman County, Kansas; collected by H. T. Martin and party in 1926.

KUVP 1470 *Ogallalabatrachus horarium* n. gen. and n. sp.—Taylor 1941B: p. 181, text-figs. 7A-C; holotype; dorsal vertebra.

Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); Rhino Hill Quarry, SE¼, NE¼, Sec. 11, T11S, R38W, Wallace County, Kansas; collected by E. H. Taylor and D. Dunkle in 1935.

Tihen (1958) considered *Lanebatrachus martini* Taylor and *Ogallalabatrachus horarium* Taylor to be synonyms of *Plioambystoma* (= *Ambystoma*) *kansense* (= *kansensis*).

"Amphibia"

KUVP ? *Onychopus gigas* gen. et sp. nov.—Martin 1922: p. 104, pls. 1 and 3; holotype; slab containing numerous tracks; specimen not relocated.

Upper Pennsylvanian, Virgilian, Douglas Group, Stranger Formation, probably Tonganoxie Sandstone in Weston Shale Member; east bank of Wakarusa River at Dightman's Crossing, 5 miles east-southeast of Lawrence, NE¼, Sec. 14, T13S, R20E, Douglas County, Kansas; collected by R. and J. Coghill in 1919.

This material was originally described by Martin as tracks of a giant amphibian, however, Baird (1963) referred to them as fossil tree stump holes.

COHORT AMNIOTA Haeckel 1866
CLASS "REPTILIA" Laurenti 1768 (excluding Aves and Mammalia)
Subclass Captorhinomorpha Watson 1917
Suborder Captorhinoidea Vaughn 1955
Family Captorhinidae Case 1911
Captorhinidae indet.
Pleuristion brachycoelus Case 1902, *nomen dubium*
(Type-species)

When first described, Case considered *Pleuristion brachycoelus* to be of indeterminate affinity within the Reptilia. In 1907 Case placed the genus in the suborder Pelycosauria, *incertae sedis*, but in 1911A he included *Pleuristion* in the amphibian suborder Temnospondyli. Olson (1970) stated that Case, in considering *Pleuristion* to be a temnospondylous amphibian, was confusing the similarity in form between microsaurs and captorhinomorphs. Williston (1910B) referred *Pleuristion* back to the Reptilia, and in 1916, noted the similarities between it and the captorhinid, *Captorhinus*. Von Huene (1925) placed *Pleuristion* back in the Pelycosauria but later Romer and Price (1940), on the basis of more material, placed the genus in the order Cotylosauria. Later Romer (1956, 1966) placed the genus in the family Captorhinidae and Olson (1970) followed Romer's conclusions. Heaton (1980) considered the Cotylosauria (consisting of the seymouriamorphs, diadectids, and related forms), to be an order of advanced non-anthracosaurian amphibians in the subclass Batrachosauria, closely related to the Reptilia. According to Olson (1984) KUVP 351 is indeterminate within the Captorhinidae and *P. brachycoelus* is a *nomen dubium*.

KUVP 351 *Pleuristion brachycoelus*, gen. et sp. nov.—Case 1902: p. 67; no text-figures; holotype; a series of three cervical vertebrae. In the original description, Case failed to designate a holotype. Instead he used two specimens which Olson (1970) considered as representing two different individuals, an adult and a juvenile, designated KUVP 351a and 351b respectively. Olson referred to the adult specimen as the holotype. Also see KUVP 65275.

Pleuristion brachycoelus—Case 1907: pl. 1, figs. 14-15.

Pleuristion brachycoelus Case—Olson 1970: text-fig. 3A-C; pl. 2, fig. D. Type locality erroneously stated to be in Logan County, Oklahoma.

Pleuristion brachycoelus—Olson 1984: text-fig. 6A-C, lower figure (from

Olson 1970, text-fig. 3A-C). Type locality erroneously stated to be in Logan County, Oklahoma.

KUVP 65275 *Pleuristion brachycoelus* Case—Olson 1970: fig. 3J, pl. 2, fig. E. This specimen, along with KUVP 351, is the original material used by Case in erecting the genus, and consists of eleven vertebrae plus rib fragments, a femur, and phalangeal elements from an immature individual. This specimen was designated by Olson as referred material and given the number KUVP 351b. Locality erroneously stated by Olson to be in Logan County, Oklahoma.

KUVP 351, 65275 Lower Permian, Wichita Group, Wellington Formation; at Alva, two miles northeast of Orlando; SE¼, Sec. 31, T20N, R1W; Noble County, Oklahoma; collected by G. W. Stevens.

Captorhinus Cope 1896
Captorhinus aguti (Cope 1882)

KUVP 8964 *Captorhinus*—Peabody 1951: text-fig. 2; figure is a composite of the right tarsus, based on KUVP 8964, 8965, and 9783. The astragalus, tibiale, centralia, and distal tarsale 1, 2, and 3, in the figure are based on KUVP 8964 (also see KUVP 9783); pl. 1, fig. D, right astragalus and "navicular."

Captorhinus sp.—Peabody 1952: fig. 10D. Erroneously listed as KUVP 8694.

Captorhinus—Huene 1956: text-fig. 291 (after text-fig. 2 in Peabody 1951).

Captorhinus—Romer 1956: text-fig. 188c, (after text-fig. 2 in Peabody 1951), figure is reversed.

Captorhinus—Carroll 1969: text-fig. 13 (after text-fig. 2 in Peabody 1951).

KUVP 8965 *Captorhinus*—Peabody 1951: text-fig. 2; a composite of the right tarsus based on KUVP 8964, 8965, and 9783. It is not possible to identify which element in the figure is based upon KUVP 8965. This number is represented by an incomplete pes with an associated tibia and femur.

Captorhinus—Huene 1956: text-fig. 291 (after text-fig. 2 in Peabody 1951).

Captorhinus—Romer 1956: text-fig. 188c (after text-fig. 2 in Peabody 1951), figure is reversed.

Captorhinus—Carroll 1969: text-fig. 13, (after text-fig. 2 in Peabody 1951).

KUVP 9783 *Captorhinus*—Peabody 1951: text-fig. 2; a composite of the right tarsus based on KUVP 8964, 8965, and 9783. The astragalus and calcaneum in the figure is KUVP 9783. Plate 1, fig. B, left astragalus with associated calcaneum.

Captorhinus—Huene 1956: text-fig. 291 (after text-fig. 2 in Peabody 1951).

Captorhinus—Romer 1956: text-fig. 188c (after text-fig. 2 in Peabody 1951), figure is reversed.

Captorhinus—Carroll 1969: text-fig. 13 (after text-fig. 2 in Peabody 1951).

KUVP 9782 *Captorhinus*—Peabody 1951: pl. 1, fig. A, left astragalus with associated calcaneum.

KUVP 9785 *Captorhinus*—Peabody 1951: pl. 1, fig. C, left astragalus.

KUVP 9784 *Captorhinus*—Peabody 1951: pl. 1, fig. E, two astragali, sectioned to show details of internal structure.

KUVP 9610 *Captorhinus*—Peabody 1952: text-fig. 10A, atlantal centrum.

KUVP 9609 *Captorhinus*—Peabody 1952: text-fig. 10B, atlantal arch.

KUVP 9608 *Captorhinus*—Peabody 1952: text-fig. 10C, astragalus.

KUVP 14753 *Captorhinus*—Fox 1964: text-fig. 4; listed by Fox as KUVP 8963.
Captorhinus aguti (Cope)—Fox and Bowman 1966: text-fig. 21.2; erroneously listed as KUVP 14756.
Posterior part of left mandibular ramus.

KUVP 9978 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 1.
Captorhinus aguti—Gaffney and McKenna 1979: text-fig. 5. Skull.

KUVP 14746 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 10.1-10.3.
Right palatine.

KUVP 14755 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 12.1-12.4.
Captorhinus aguti—Kuhn 1969: pl. 18.7-18.10 (after text-fig. 12.1-12.4 in Fox and Bowman 1966).
Left epipterygoid.

KUVP 14754 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 13.1-13.4.
Captorhinus aguti—Kuhn 1969: pl. 18.13-18.16 (after text-fig. 13.1-13.4 in Fox and Bowman 1966).
Right quadrate.

KUVP 14750 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 18.1-18.3; incomplete basi-parasphenoid; erroneously cited as KUVP 14749.

KUVP 8963 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 20.1-20.2; incomplete right mandibular ramus.

KUVP 14756 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 21.1; posterior part of left mandibular ramus; erroneously listed as KUVP 14753.

KUVP 14744 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 24; scapulocoracoid, erroneously listed as KUVP 14757.

KUVP 14749 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 25; right scapulo-coracoid.

KUVP 14745 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 28.1-28.4.
Captorhinus aguti—Kuhn 1969: pl. 19.5-19.8, (after text-fig. 28.1-28.4 in Fox and Bowman 1966).
Left humerus.

KUVP 14752 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 29.1-29.3.
Captorhinus aguti—Kuhn 1969: pl. 19.11-19.13, (after text-fig. 29.1-29.3 in Fox and Bowman 1966).
Left ulna.

KUVP 14748 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 32.1-32.2; left pelvis.

KUVP 14747 *Captorhinus aguti* (Cope)—Fox and Bowman 1966: text-fig. 33.1-33.4.
Captorhinus aguti—Kuhn 1969: pl. 19.1-19.4, (after text-fig. 33.1-33.4 in Fox and Bowman 1966).
Left femur.

KUVP 8962 *Captorhinus aguti* (Cope)—Holmes 1977: text-fig. 1A,B; anterior portion of interclavicle; text-fig. 1 E,F, reconstruction based on KUVP 8962 and 65541.

KUVP 65541 *Captorhinus aguti* (Cope)—Holmes 1977: text-fig. 1C,D; stem of interclavicle; text-fig. 1E,F, reconstruction based on KUVP 65541 and 8962, but only cited as KUVP 8962.

KUVP 65542 *Captorhinus aguti* (Cope)—Holmes 1977: text-fig. 3C,D; left scapulocoracoid; text-fig. 5A,B, reconstruction based on MCZ 4345 and KUVP 65542; cited as KUVP 8962.

KUVP 65544 *Captorhinus aguti* (Cope)—Holmes 1977: text-fig. 8A-F; left humerus, cited as KUVP 8962.

KUVP 65545 *Captorhinus aguti* (Cope)—Holmes 1977: text-fig. 9A-F; left radius; cited as KUVP 8962.

KUVP 65546 *Captorhinus aguti* (Cope)—Holmes 1977: text-fig. 11A; ulnare, cited as KUVP 8962.

KUVP ? *Captorhinus aguti* (Cope)—Holmes 1977: text-fig. 11B; intermedium. Specimen not relocated; cited as KUVP 8962.

KUVP 65548 *Captorhinus aguti* (Cope)—Holmes 1977: text-fig. 11C; radiale. Erroneously cited as AMNH 2465.

KUVP 8962-65, 9608-9610, 9783-85, 9978, 14745-50, 14752, 14754-56, 65541-42, 65544-48 Lower Permian, Wichita Group, Wellington Formation, fissure fills within the Ordovician Arbuckle Limestone; Dolese Brothers limestone quarry at Richards Spur just west of U.S. Hwys. 62 and 281, 10.5 miles south of Apache, 6 miles north of Fort Sill, SW¼, Sec. 31, T4N, R11W, Comanche County, Oklahoma; collected by F. E. Peabody, 1950, 1951, 1953.

Subclass Testudines Linnaeus 1758
Order Casichelydia Gaffney 1975
Suborder Cryptodira (Cope 1868)
Superfamily Chelonioidea Baur 1893
Family Protostegidae Cope 1873
Subfamily Protosteginae Wieland 1902
Protostega Cope 1871
Protostega gigas Cope 1871

KUVP 1202 *Protostega*—Case 1897: pl. 4; pl. 5, figs. 9-11 (enlargements of certain elements from pl. 4).
Protostega gigas Cope—Hay 1908: text-fig. 250, (after pl. 4 in Case 1897).
Incomplete plastron with nuchal plate and marginalia; specimen is now missing pieces of certain elements figured by Case.
Upper Cretaceous, Campanian, Niobrara Formation, Smoky Hill Chalk Member; Charley Bennett Ranch, west of Russell Springs, T13S, R35W, Logan County, Kansas; collected by H. T. Martin.

KUVP 4863 *Protostega*—Case 1897: pl. 6, figs. 12-15, 18; humerus, scapula, coracoid, pubis, and femur, respectively. Specimens represented by figs. 17 and 19, if KUVP specimens, have not been relocated.
Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Logan County, Kansas; collected by H. T. Martin in 1894.

KUVP 1208 *Protostega*—Case 1897: pl. 6, fig. 16; many pieces (may not all belong to one individual): ischium, humerus, ribs, plastron.
Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; 2.5 miles southeast of Elkader, Sec. 11, T15S, R32W, Logan County, Kansas; collected by T. R. Overton and H. T. Martin in 1895.

KUVP 1201 *Protostega*—Williston 1902A: text-fig. 1, hind limb, missing some phalangeal elements.
Upper Cretaceous, Campanian, Niobrara Formation, Smoky Hill Chalk Member; Charley Bennett Ranch, west of Russell Springs, T13S, R35W, Logan County, Kansas; collected by C. M. Sternberg in 1900.

Subfamily Chelospharginae Zangerl 1953a
Chelosphargis Zangerl 1953a

Chelosphargis advena (Hay 1908)
(Type-species)

KUVP 1209 *Protostega advena* sp. nov.—Hay 1908: p. 199, text-figs. 256-259; holotype; plastron, twelve marginalia, two or three neuralia, and portions of two costal plates.

Upper Cretaceous, Senonian or Niobrara Formation, Smoky Hill Chalk Member; exact locality doubtful, Logan County, Kansas.

KUVP 1219 *Chelosphargis advena* (Hay)—Zangerl 1953A: text-fig. 21A-N.

Chelosphargis advena—Gaffney 1979: text-fig. 191A-E, (after text-fig. 21A-E in Zangerl 1953A).

Skull roof, mandible, hyoid element, marginalia, costal plates, epiplastra, entoplastron, xiphiplastra, scapular fragment, coracoid, and cervical vertebrae, second right costal plate with connecting neural.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality in doubt, but probably collected in Gove County, Kansas, by S. W. Williston in 1891.

KUVP 1258 *Chelosphargis advena* (Hay)—Zangerl 1953A: text-fig. 25A-B; marginalia, posterior portion of carapace and middle part of carapacial disk of an immature individual.

Upper Cretaceous, Coniacian or Santonian, Niobrara Formation, Smoky Hill Chalk Member; Martin's Canyon, Secs. 14-15, 22-23, 26, 34-35, T14S, R26W, Gove County, Kansas; collected by H. T. Martin in 1910.

Family Toxochelyidae Hay 1902
Porthochelys Williston 1901
Porthochelys laticeps Williston 1901
(Type-species)

KUVP 1204 *Porthochelys laticeps*, gen. et sp. nov.—Williston 1901B: p. 195. pl. 19, figs. 1-2, pls. 20-21, pl. 22, figs. 1-2.

Porthochelys laticeps Williston—Hay 1908: text-figs. 231-234, pl. 31, figs. 2,3.

Porthochelys laticeps Williston—Zangerl 1953B: text-fig. 83 (these are corrected illustrations after pl. 19, fig. 1-2 in Williston 1901B), text-fig. 84 (after pl. 21 and pl. 22, fig. 2, respectively, in Williston 1901B).

Porthochelys laticeps Williston—Sukhanov 1964: text-fig. 419a and b (redrawn from text-figs. 231 and 232 in Hay 1908); text-fig. 419c (after text-fig. 234 in Hay 1908); text-fig. 419d (redrawn from pl. 31, fig. 3 in Hay 1908).

Holotype; greater portion of the skull, dentary, entire left side of carapace, entire plastron (except epiplastra and entoplastron) and right humerus.

Upper Cretaceous, Coniacian or Santonian, Niobrara Formation, Smoky Hill Chalk Member; on the Saline River, Trego County, Kansas; collected by E. H. Sellards in 1900.

Toxochelys Cope 1873
Toxochelys brachyrhinus Case 1898

KUVP 1215 *Toxochelys latiremis* Cope—Case 1898: pl. 79; greater portion of skull.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Gove County, Kansas; collected by E. P. West.

KUVP 8258 *Toxochelys latiremis*—Case 1898: pl. 80, figs. 1-2.

Toxochelys latiremis Cope—Hay 1908: text-fig. 206 (redrawn from pl. 80, figs. 1,2 in Case 1898).

Toxochelys—Williston 1914: text-fig. 113 (after text-fig. 206 in Hay 1908).

Scapula and right coracoid.

KUVP 1227 *Toxochelys latiremis*—Case 1898: pl. 81, fig. 1; femur, lower jaw.

KUVP 1225 *Toxochelys latiremis*—Case 1898: pl. 81, fig. 2, pl. 82, fig. 6; femur, ischium, ilium, and other fragments.

KUVP ? *Toxochelys latiremis*—Case 1898: pl. 81, figs. 3-5, 10-11, pl. 83, figs. 2-4; specimens not relocated.

KUVP ?, 1225, 1227, 8258 Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, western Kansas.

KUVP 65547 *Toxochelys latiremis*—Case 1898: pl. 81, figs. 6-8; proximal end of humerus, right ilium.

Upper Cretaceous, Coniacian, Niobrara Formation, Smoky Hill Chalk Member; 3.5 miles southwest of Castle Rock, Sec. 22-23, T14S, R26W, Gove County, Kansas; collected by S. W. Williston in 1891.

KUVP 1216 *Toxochelys latiremis*—Case 1898: pl. 82, figs. 1 (KUVP 1216b) and 2 (KUVP 1216a), four elements comprising the first and fourth or fifth finger, and other finger elements.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, western Kansas; collected by H. T. Martin.

KUVP 1212 *Toxochelys brachyrhinus*, sp. nov.—Case 1898: p. 378, pl. 84, fig. 1; figure 2 is a reconstruction of the skull.

Toxochelys brachyrhina (error) Case—Hay 1908: pl. 31, fig. 1.

Toxochelys latiremis Cope—Zangerl 1953B: pl. 11, lower figures.

Holotype; crushed skull with mandible.

Zangerl (1953B) considered *Toxochelys branchyrhina* (error) Case to be a synonym of *Toxochelys latiremis* Cope. However, the type of *T. latiremis* is now thought to be from the Pierre Shale Formation and differs morphologically from Niobrara *Toxochelys*. *T. brachyrhinus* is used here as the valid name for all Niobrara *Toxochelys* (R. Hirayama, personal communication, 1985).

KUVP 1203 *Toxochelys latiremis* Cope—Williston 1901B: pl. 18; skull.

Toxochelys—Bennett 1984: text-fig. 83B (after pl. 18 in Williston 1901B).

KUVP 1212, 1203 Upper Cretaceous, Coniacian, Niobrara Formation, Smoky Hill Chalk Member; 3.5 miles southwest of Castle Rock, Secs. 22-23, T14S, R26W, Gove County, Kansas; collected by S. W. Williston in 1891.

KUVP 1244 *Toxochelys latiremis* Cope—Zangerl 1953B: text-fig. 73, reconstruction of plastron, based on KUVP 1244; pl. 21.

Toxochelys latiremis Cope—Mlynarski 1976: text-fig. 38 (after text-fig. 73 in Zangerl 1953B).

Carapacial and plastral elements, vertebrae, limb bones, and anterior portion of the skull of a juvenile individual, in matrix.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

Toxochelys latiremis (Hay 1905)

When originally described by Hay in 1905, *T. browni* was placed in the genus *Porthochelys* Williston. Zangerl (1953B) considered it as belonging to the genus *Toxochelys*, as *T. browni* (Hay). He also referred the following KUVP material, identified by Wagner (1898) as *T. latiremis* Cope, to *T. browni* (Hay). According to R. Hirayama (personal communication, 1985) the type material of *T. latiremis* Cope 1873 is probably from

the Pierre Shale Formation and is indistinguishable from *T. browni* (Hay 1905). *T. browni* is therefore a junior synonym of *T. latiremis*.

KUVP 1293 *Toxochelys latiremis* Cope—Wagner 1898: text-fig. 1; posterior portion of the skull (cited as KUVP 1221); not relocated.

Upper Cretaceous, Campanian, Pierre Shale Formation, Sharon Springs Shale Member; Eagle Tail Creek, near Sharon Springs, T13S, R40W, Wallace County, Kansas; collected by S. W. Williston in 1891.

KUVP 1294 *Toxochelys latiremis* Cope—Wagner 1898: text-fig. 2; fragment of the lower jaw (cited as KUVP 1222); not relocated.

Upper Cretaceous, Campanian, Pierre Shale Formation, Sharon Springs Shale Member; near Lisbon, Sec. 8, T12S, R36W, Logan County, Kansas; collected by Sydney Prentice in the summer of 1898.

Ctenochelys Zangerl 1953b

Ctenochelys sp.

KUVP 2050 *Toxochelys procax* Hay—Hay 1908: text-fig. 228; isolated mandible.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Kansas.

Ctenochelys stenoporus (Hay 1905)

Case (1898) identified the following material as *Toxochelys serrifer* Cope. Hay (1905) reexamined the specimens and determined that Case, by not having access to Cope's type material of *T. serrifer* had misidentified the KUVP material. Hay considered it a new species. *T. stenoporus* Hay and specified that any bones bearing number KUVP 2060 should be considered the type material for this form.

KUVP 1205 *Toxochelys serrifer* Cope—Hay 1898: text-figs. 1-3 (the anteriormost neural in text-fig. 2 is missing.)

Toxochelys serrifer Cope—Case 1898: pl. 80, figs. 6 coracoid (lower half now missing), 8,9; specimen in fig. 8 not relocated; pl. 82, figs. 12,13, pl. 83, fig. 1.

Ctenochelys stenopora (error) (Hay)—Zangerl 1953B: text-fig. 108.

Fragmentary posterior left half of carapace, consisting of five costals, third and fifth through eighth neurals, marginalia, and pygals, coracoid, humerus, ilium, phalanges, carpal bones.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown; western Kansas.

KUVP 2060 *Toxochelys serrifer* Cope—Case 1898: pl. 80, figs. 3,4,5 (specimen fig. 5 not relocated), pl. 82, figs. 3,4,5.

Toxochelys stenoporus sp. nov.—Hay 1905: pl. 180, text-figs. 8-11.

Hay erroneously stated that the marginalia figured by Case (1898), in pl. 83, fig. 1, bear the number KUVP 2060. These three bones bear the old number KUVP 1270, but actually belong to KUVP 1205. In his 1908 tome, he stated that plates 80, 82 and 83 in Case (1898) are a composite of KUVP 2060 and KUVP 1270, but that all of this material belongs to the same species. According to Hay the elements in pl. 80, fig. 4 and pl. 83, fig. 1, belong to KUVP 1270.

Toxochelys stenopora (error) Hay—Hay 1908: text-figs. 214-217 (after text-figs. 8-11 in Hay 1905) text-figs. 218-220. Hay specified that any bone bearing the number KUVP 2060 should be regarded as belonging to the holotype of *T. stenopora* (error) Hay.

Ctenochelys stenopora (error) (Hay)—Zangerl 1953B: text-fig. 107 (reconstruction of the plastron based on KUVP 2060, pl. 80, figs. 3-5 in Case (1898), and text-fig. 220 in Hay (1908)).

Holotype; fragmentary skull, mandible, dentary, hypoplastron, xiphiplastron, left hyoplastron, marginalia, nuchal, limb elements.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Gove County, Kansas; collected by S. W. Williston in 1891.

KUVP 1228 *Toxochelys* sp. indet.—Hay 1908: pl. 30, figs. 1,2.
Ctenochelys stenopora (error) (Hay)—Zangerl 1953B: text-fig. 108. Zangerl suggested this material may belong to *Ctenochelys procax* (Hay), since it differs substantially from KUVP 1205 *(C. stenoporus).*
Fifteen marginalia, fragments of costals, and a series of neuralia, including two suprapygals.
Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; near Monument Rock, Gove County, Kansas; collected by H. T. Martin.

Family Cheloniidae Gray 1825
Desmatochelys Williston 1894
Desmatochelys lowi Williston 1894
(Type-species)

KUVP 1200 *Desmatochelys Lowii* Williston (error)—Williston 1894B: p. 5, text-figs. on pp. 12 (text-fig. 8a, 8c, 8-11 not relocated), 15 (not relocated), 16; pls. 2-4; pl. 5, figs. 1,2a,2,3 (specimens of figs. 1,2a not relocated), pl. 6, figs. 1,1a,1b,2-4.
Desmatochelys lowii Williston (error)—Williston 1898C: pls. 73-75 (after pls. 2-4 in Williston 1894); pl. 76, fig. 1 (after text-fig. on p. 16 in Williston 1894), fig. 2 (after text-fig. on p. 15 in Williston 1894, not relocated), figs. 8, 8a-c, 9-11 (after text-figs. on p. 12 in Williston 1894, only elements in figs. 8,8b relocated); pl. 77, figs. 1-3, fig. 1 is inverted (after pl. 5, figs. 1-3 in Williston 1894, elements of figs. 1,2a not relocated); pl. 78, figs. 1,1a-b,2-4 (after pl. 6, figs. 1,1a-b, 2-4 in Williston 1894).
Desmatochelys Lowii Williston (error)—Wieland 1900: text-fig. 13 (after pl. 4 in Williston 1894).
Desmatochelys lowi Williston—Hay 1908: text-figs. 238-243 (element in fig. 242 not relocated).
Desmatochelys lowii (error)—Williston 1914: text-fig. 122 (after text-figs. 238,239 in Hay 1908).
Desmatochelys lowi Williston—Müller 1968: text-fig. 82a,b (after text-figs. 238,239 in Hay 1908).
Desmatochelys lowi Williston—Zangerl and Sloan 1960: text-fig. 4, sketch of skull made by T. H. Eaton.
Desmatochelys lowi Williston—Sukhanov 1964: text-fig. 425a and b (after text-figs. 238 and 239 in Hay 1908).
Desmatochelys lowii (error)—Mlynarski 1976: text-fig. 50 (after text-fig. 82a,b in Müller 1968).
Desmatochelys lowi—Gaffney 1979: text-fig. 207 (after text-fig. 4 in Zangerl and Sloan 1960); text-fig. 208 (after pl. 4 in Williston 1894).
Porthochelys (error)—Bennett 1984: text-fig. 83A, skull and lower jaw.
Holotype; complete skull with lower jaw, metacarpals and other phalangeal elements, pygal and marginalia, fragments of some carapacial elements, right humerus, coracoid, radius and ulna, scapula-precoracoid, right pelvic bones, femur, and caudal vertebrae.
Upper Cretaceous, Turonian, Greenhorn Formation, Pfeifer Shale or

Jetmore Chalk Member; near Fairbury, Jefferson County, Nebraska; collected by B. Schrantz and N. V. Eaton in 1893.

Superfamily Testudinoidea Baur 1893
Family Chelydridae Swainson 1839
Emarginachelys Whetstone 1978
Emarginachelys cretacea Whetstone 1978
(Type-species)

KUVP 23488 *Emarginachelys cretacea* n. sp.—Whetstone 1978: p. 544, text-figs. 5-8,10-19; holotype; carapace, plastron, skull, missing lower jaw, right stapes, fragmentary hyoid, portions of the right and left forelimbs and girdles and left hind limb and girdle, right ilium, several cervical and caudal vertebrae.

Upper Cretaceous, Maestrichtian, Hell Creek Formation; SW¼, NW¼, Sec. 35, T21N, R37E, Garfield County, Montana; collected by D. and S. Rasmussen and J. Chorn in the summer of 1971.

Family Emydidae Gray 1825
Subfamily Emydinae Gray 1825
Chrysemys Gray 1844
Chrysemys hilli (Cope 1878)

KUVP 7676 *Chrysemys limnodytes*, new species—Galbreath 1948: p. 269; pl. 1, figs. A,B.

Chrysemys limnodytes (=*P. hilli*)—Adler 1968: text-figs. 1D, 2.

Holotype; fragmental anterior portion of carapace, left side of plastron, and several marginalia.

Tertiary, Late Miocene, Laverne Formation, Marl beds; SW¼, Sec. 15, T4N, R25E, Beaver County, Oklahoma; collected by a University of Kansas field party in the summer of 1946.

Adler (1968) considered *Chrysemys limnodytes* Galbreath to be a synonym of *Pseudemys hilli* (Cope). He also stated that Galbreath's original reconstruction of this fossil is incorrect in several respects. McDowell (1964) contended that *Pseudemys* and *Chrysemys* should be combined into a single genus,*Chrysemys*. Zug (1966) and Ernst and Barbour (1972) agreed with McDowell's conclusions.

Emydoidea Gray 1870
Emydoidea blandingi (Holbrook 1838)

KUVP 6478 *Emys twentei* sp. nov.—Taylor 1943: p. 250, pl. 20; holotype, posterior three-fourths of the carapace.

Quaternary, Odee Formation, Pleistocene high terrace sands; north side of the Cimarron River, 9 miles south of State Lake, probably Sec. 33, T34S, R29W, XI Ranch, Meade County, Kansas; collected by Jack Twente in the summer of 1942.

Schultz (1965) and Gehlbach (1965), both referred to this taxon as *Emydoidea twentei* Taylor. Preston and McCoy (1971), with additional fossil *Emydoidea* and *Emys* material at hand, concluded that *Emys twentei* Taylor should be referred to *Emydoidea blandingi* (Holbrook).

Family Testudinidae Gray 1825
Hesperotestudo Williams 1950
Hesperotestudo riggsi (Hibbard 1944)

Williams (1950) synonymized *Testudo riggsi* Hibbard into the genus *Gopherus*, as *G. riggsi* (Hibbard). Oelrich (1957), considering *T. riggsi*

Hibbard to be a synonym of *T. turgida*, placed both in the genus *Geochelone* (subgenus *Hesperotestudo*), and stated that *Geochelone riggsi* (Hibbard) represents a phyletic intermediate between *G. turgida* (Cope) and *G. incisa* (Hay). Bramble in an unpublished work cited by Preston (1979) argued that *Geochelone* does not occur in the Western hemisphere. Therefore Preston used *Hesperotestudo* as the generic name for New World "*Geochelone.*"

KUVP 6789 *Testudo riggsi* sp. nov.—Hibbard 1944: p. 72, text-figs. 1,2.
Testudo turgida Cope—Oelrich 1957: text-figs. 2,3.
Geochelone riggsi (Hibbard)—Auffenberg 1963: text-fig. 31 (after text-figs. 2,3 in Oelrich 1957), erroneously listed as a paratype.
Holotype; a nearly complete carapace and plastron.

KUVP 6790 *Testudo riggsi* sp. nov.—Hibbard 1944: p. 72; paratype; complete plastron and nearly complete carapace.

KUVP 6789, 6790 Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); Sec. 35, T34S, R31W, XI Ranch, south side of Cimarron River, Seward County, Kansas; collected by C. W. Hibbard and T. McLaughlin in June, 1943.

Hesperotestudo gilberti (Hay 1899)

KUVP 1245 *Xerobates* (?) *undata* Cope—Gilbert 1898: text-figs. 1-4.
Testudo gilbertii—Hay 1899: p. 349, no figures.
Testudo gilberti Hay—Hay 1908: pl. 80, figs. 2-5.
Holotype; skull with lower jaw, pectoral girdle, pelvic girdle, limbs, cervical vertebrae.
Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); Phillips County, Kansas; collected by E. P. West and T. R. Overton.
Gilbert (1898) tentatively identified this material as *Xerobates undata* Cope. Hay (1899) placed it in the genus *Testudo* as a new species, based on the figures provided by Gilbert. Auffenberg (1963, 1974) placed it in the genus *Geochelone* (subgenus *Hesperotestudo*), and suggested that it is probably a synonym of *Geochelone osborniana* (Hay).

Hesperotestudo campester (Hay 1903)

KUVP 9399 *Testudo rexroadensis* sp. nov.—Oelrich 1952: p. 301, text-figs. 2,3; paratype; fragments of a carapace and a nearly complete plastron.
Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); W½, SW¼, Sec. 22, T33S, R29W, Meade County, Kansas; collected by University of Kansas field party in 1940.
Auffenberg (1963, 1974) considered *Testudo rexroadensis* Oelrich to be a member of the genus *Geochelone* (subgenus *Hesperotestudo*) and a synonym of *Geochelone campester* (Hay), closely related to *G. orthopygia* (Cope).

Hesperotestudo orthopygia (Cope 1878)

KUVP 1262 *Caryoderma snovianum* Cope, sp. nov.—Cope 1886: p. 1045.
Caryoderma snovianum Cope—Cope 1889: pl. 32, figs. 1-17. The specimens reproduced in figs. 8,15-15a, and 16-16a, have not been relocated.
Holotype; various dermal ossicles and a single phalangeal element figured by Cope (1889). Material not figured includes more dermal ossicles, fragmentary limb bones, phalangeal, and carapacial elements.
Tertiary, Late Miocene, Ogallala Formarion (Hemphillian land mammal age); Decatur County, Kansas; collected by C. H. Sternberg in 1878.
Cope described this material in 1886 as, ". . . a portion of the dermal

skeleton of an armadillo, probably in the family Glyptodontidae . . .'' Later (1889) he figured the material. In 1898E, Williston correctly identified these bones as the carapacial osteoderms of a large tortoise and provisionally placed the material in the genus *Xerobates*, ''. . . specifically probably identical with *Testudo undata* Cope.'' Hay (1902) listed this species as *Testudo snoviana* (Cope), but later placed *Caryoderma snovianum* Cope in the synonymy of *Testudo orthopygia* (Cope). Williams (1950) placed *T. orthopygia* (Cope) in the genus *Geochelone* Fitzinger.

KUVP 16340 *Testudo*—Williams 1975: text-fig. 20; nearly complete carapace and plastron, pelvis, and limb bones.

Tertiary, Late Miocene, Ogallala Formation (Hemphillian land mammal age); road cut north of Bluff Creek, Beckerdite Ranch, near center of Sec. 8, T31S, R22W, Clark County, Kansas; found by L. R. Chilson and collected by O. T. Bonner in 1969.

Subclass Sauropsida Huxley 1864
Superorder Lepidosauria Haeckel 1866
Order ''Eosuchia'' Broom 1914
Family Petrolacosauridae Peabody 1952
Petrolacosaurus Lane 1945
Petrolacosaurus kansensis Lane 1945
(Type-species)

KUVP 1424 *Petrolacosaurus kansensis*, gen. et sp. nov.—Lane 1945A: p. 381, holotype; text-fig. 1, nearly complete hind limb lacking a portion of the distal articulation of the femur and the proximal half of the tibia and fibula.

Petrolacosaurus kansensis Lane—Peabody 1952: text-fig. 8, adult right femur; text-fig. 9, right pes of adult.

Petrolacosaurus Peabody (error)—Huene 1956: text-fig. 460D (after text-fig. 9 in Peabody 1952).

Petrolacosaurus kansensis Lane—Müller 1968: text-fig. 170B (after text-fig. 460D in Huene 1956).

Petrolacosaurus kansensis Lane—Reisz 1981: text-fig. 24A, reconstruction of left pes, based primarily on KUVP 1424 and 9951b.

KUVP 1423 *Podargosaurus hibbardi*, gen. et sp. nov.—Lane 1945A: p. 385; holotype; text-fig. 3, nearly complete right forelimb (erroneously listed as the left forelimb). Associated type material includes the crural, tarsal, and pedal portions of a hind limb; a second forelimb, several dorsal vertebrae; thirty or more caudal vertebrae and several ribs.

Petrolacosaurus kansensis Lane—Peabody 1952: text-fig. 6C, subadult right forelimb.

Peabody (1952) placed this type in the synonymy of *Petrolacosaurus kansensis* Lane. He also stated that the limb bones figured by Lane (1945A) as the type of *Podargosaurus hibbardi* cannot be associated with the remaining portions of the skeleton mentioned above.

Petrolacosaurus Peabody (error)—Huene 1956: text-fig. 460C (after text-fig. 6C in Peabody 1952; image reversed).

Petrolacosaurus kansensis Lane—Müller 1968: text-fig. 170A (after text-fig. 460C in Huene 1956; image reversed).

Petrolacosaurus kansensis Lane—Reisz 1981: text-fig. 21A,B, reconstruction of right manus, based primarily on KUVP 1423, 8355, and 9957b.

KUVP 8351 *Petrolacosaurus kansensis* Lane—Peabody 1952: text-fig. 1A,B, skull and

associated cervical vertebrae; pl. 1A, immature skull and cervical vertebrae, with associated cupule of pteridosperm; pl. 2A, immature skull and cervical vertebrae (photograph of specimen represented in text-fig. 1A,B).

Petrolacosaurus Peabody (error)—Huene 1956: text-fig. 460B (after text-fig. 1A in Peabody 1952).

KUVP 1427 *Petrolacosaurus kansensis* Lane—Peabody 1952: text-fig. 2, post-cranial skeleton of young adult; text-fig. 3A, cervical vertebrae (details of proatlas from KUVP 8351); text-fig. 3C, fifteenth caudal vertebra; text-fig. 11, reconstruction of skull and skeleton based primarily on KUVP 1427; pl. 2B, forelimb, with associated cone of conifer, *Walchia*.

Petrolacosaurus Peabody (error)—Huene 1956: text-fig. 460A (after text-fig. 11 in Peabody 1952).

Petrolacosaurus kansensis Lane—Tatarinov 1964B: text-fig. 286 (after text-fig. 11 in Peabody 1952).

Petrolacosaurus kansensis Lane—Müller 1968: text-fig. 169 (after text-fig. 11 in Peabody 1952).

KUVP 9954 *Petrolacosaurus kansensis* Lane—Peabody 1952: text-fig. 3B; pl. 1B, three anterior dorsal vertebrae. Only the anterior (left) most vertebra is figured. Cited by Peabody 1952 as "loaned from Nebraska Geological Survey (no number)."

KUVP 1428 *Petrolacosaurus kansensis* Lane—Peabody 1952: text-fig. 4, subadult skeleton with fragmentary skull.

KUVP 1426 *Petrolacosaurus kansensis* Lane—Peabody 1952: text-fig. 6A, immature right hind limb, lacking femur.

KUVP 1429 *Petrolacosaurus kansensis* Lane—Peabody 1952: text-fig. 6B, immature left forelimb.

KUVP 8355 *Petrolacosaurus kansensis* Lane—Peabody 1952: text-fig. 7, right carpus of young adult; pl. 1C, carpus (photograph of specimen represented in fig. 7).

Petrolacosaurus—Carroll 1977: text-fig. 11B (after text-fig. 21A, reversed, in Reisz 1981).

Petrolacosaurus kansensis Lane—Reisz 1981: text-fig. 21A,B, reconstruction of right manus, based primarily on KUVP 8355, 1423 and 9957b.

KUVP 33607 *Petrolacosaurus kansensis*—Carroll 1975: text-fig. 13 (after text-fig. 2, central figures in Reisz 1977).

Petrolacosaurus kansensis—Reisz 1977: text-fig. 2, lower left-hand figure, reconstruction of occipital view of skull, based mainly on KUVP 33607 and 9951; text-fig. 2, central figures, reconstruction of dorsal and palatal views of skull, based mainly on KUVP 33607, 33606, and 9952; text-fig. 2, top figure, based mainly on KUVP 33607 and 9952.

Petrolacosaurus—McFarland, et al. 1979: fig. 13-8A (redrawn from fig. 2, top figure in Reisz 1977).

Petrolacosaurus—Kuhn-Schnyder 1980: fig. 9.8C (redrawn from fig. 2, top figure in Reisz 1977).

Petrolacosaurus kansensis Lane—Reisz 1981: text-fig. 1 (reconstructed skull only), based primarily on KUVP 33607 and 9952; text-fig. 2A, top figure (after text-fig. 2, top figure, in Reisz 1977); text-fig. 2B, left mandible, based upon KUVP 33607 and 9952; text-fig. 3, (after text-fig. 2, central figures in Reisz 1977); text-fig. 4 (after text-fig. 2,

lower left-hand figure in Reisz 1977); text-figs. 12,13, mature skull and lower jaws with articulated cervical vertebrae and isolated cleithrum; text-fig. 14A, left proatlas; text-fig. 14E, atlas-axis complex, based on KUVP 33607 and 33604.

KUVP 33606 *Petrolacosaurus kansensis*—Carroll 1975: text-fig. 13 (after text-fig. 2, central figures in Reisz 1977).

Petrolacosaurus kansensis—Reisz 1977: text-fig. 2, central figures based primarily upon KUVP 33606, 33607, and 9952.

Petrolacosaaurus kansensis—Reisz 1981: text-fig. 3 (after fig. 2, central figures in Reisz 1977); text-fig. 11, mature skull and left lower jaw; text-fig. 22A,B, left femur, based mainly on KUVP 33606 and 9951; text-fig. 24C, right astralagus.

KUVP 9951 *Petrolacosaurus kansensis*—Carroll 1975: text-fig. 13 (after text-fig. 2, central figures in Reisz 1977).

Petrolacosaurus kansensis—Reisz 1977; text-fig. 2, lower left hand figure, reconstruction of occipital view of skull, based mainly on KUVP 9951 and 33607.

Petrolacosaurus kansensis Lane—Reisz 1981: text-fig. 6, mature skull and caudal vertebrae; text-fig. 7, braincase; text-fig. 14G, third cervical vertebra, based on KUVP 9951 and 9956; text-fig. 14J, sixth cervical vertebra, based on KUVP 9951 and 9956; text-fig. 14H,I, fourth and fifth cervical vertebrae; text-fig. 15A-C, dorsal vertebrae 7,8,13,14; text-fig. 15D, vertebrae 17, 18; text-fig. 16A, atlantal rib; 16B axial rib, text-fig. 16G, rib 15.

KUVP 9952 *Petrolacosaurus kansensis*—Carroll 1975: text fig. 13 (after text-fig. 2, central figures in Reisz 1977).

Petrolacosaurus kansensis—Reisz 1977: text-fig. 2 (reconstructed skull only), based upon KUVP 9952 and 33607.

Petrolacosaurus—Kuhn-Schnyder 1980: text-fig. 98C (redrawn from text-fig. 2, top figure in Reisz 1977).

Petrolacosaurus kansensis Lane—Reisz 1981: text-fig. 2A (after fig. 2 top figure in Reisz 1977); text-fig. 2B, left mandible, based upon KUVP 9952 and 33607; text-fig. 8, skull; text-fig. 3 (after text-fig. 2, central figures in Reisz 1977).

KUVP 33608 *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 5A,B, immature skull and lower jaws.

Petrolacosaurus kansensis Lane—Reisz 1981: text-fig. 10, skull and lower jaws of young adult.

KUVP 33602 *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 9A, left maxilla; 9B, cross section.

KUVP 9959a *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 9C, quadrate and quadratojugal (erroneously labeled left parietal).

KUVP 33603 *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 9D, left parietal (erroneously labeled quadrate and quadratojugal).

KUVP 33604 *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 14B, atlantal intercentrum; text-fig. 14C, left atlantal neural arch; text-fig. 14D, atlantal centrum and fused axial intercentrum; text-fig. 14E, atlas-axis complex, based on KUVP 33604 and 33607; text-fig. 14F, axis; text-fig. 16A,B, atlantal and axial ribs, based primarily on KUVP 33604 and 9951.

KUVP 9956 *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 14G, third cervical vertebra, based on KUVP 9956 and 9951; text-fig. 14J, sixth cervical vertebra, based on KUVP 9956 and 9951; text-fig. 16C, fifth

rib; text-fig. 16D, sixth (cervical) rib; text-fig. 16E, seventh (first dorsal) rib; text-fig. 16F, eighth rib; text-fig. 16H, anterior dorsal ribs 9-11.

KUVP 33606b *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 15E, dorsal vertebrae 25 and 26; text-fig. 15G, second sacral vertebra and rib; text-fig. 16I, posterior dorsal ribs 23 and 25; text-fig. 16J, first sacral ribs and vertebra.

KUVP 33605 *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 15F, first sacral neural arch and ribs.

KUVP 33606c *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 15H, I, anterior caudal vertebrae and associated ribs; text-fig. 18B, right iliac blade.

KUVP 9957a *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 17A, left scapulocoracoid in articulation with limb; text-fig. 19A-D, right humerus, based mainly on KUVP 9957 and 33606a; text-fig. 20A, left radius; text-fig. 20B, left ulna (originally published as KUVP 9957).

KUVP 9959b *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 17B, immature interclavicle.

KUVP 9958 *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 17C, immature left clavicle.

KUVP 33609 *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 17D, right scapulo-coracoid.

KUVP 9961 *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 18A, left pelvis, slightly crushed.

KUVP 9951c *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 18C, left pelvis, slightly crushed; 18C originally published as KUVP 9951.

KUVP 33606a *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 19A-D, right humerus, based primarily on KUVP 33606a and 9957.

KUVP 9957b *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 21B, reconstruction of right manus, based primarily on KUVP 9957b, 1423, and 8355.

KUVP 9951d *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 22A,B, reconstruction of left femur, based mainly on KUVP 9951d (originally published as KUVP 9950) and 33606.

KUVP 9951b *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 23A-C, left tibia; text-fig. 23D, left fibula; text-fig. 24A, reconstruction of left pes, based mainly on KUVP 9951b and 1424; text-fig. 24D, metatarsals.

KUVP 9951a *Petrolacosaurus kansensis* Lane—Reisz 1981: text-fig. 24B, left tarsus.

KUVP 1423-4, 1426-9, 8351, 8355, 8357, 9951-2, 9954, 9956-9, 9961, 33602-9 Upper Pennsylvanian, Missourian, Stanton Formation, Rock Lake Member; six miles northwest of Garnett, Sec. 32, T19S, R19E, Anderson County, Kansas.

Order Squamata Oppel 1811
Suborder Sauria Macartney 1802
Infraorder Iguania Latreille 1825
Family Iguanidae Gray 1827
Leiocephalus Gray 1827
Leiocephalus etheridgei Pregill 1981

KUVP 11473 *Leiocephalus etheridgei,* new species—Pregill 1981: p. 35, paratypes; a single right, and six left dentaries.

Quaternary, Late Pleistocene; Cuevo del Perro, Ciales Valley, about 2 kilometers south of Barrio de Barahona, Municipio de Morovis, 18°20′57″N, 66°26′47″W, Puerto Rico; collected by J. W. Bee in 1957.

Leiocephalus partitus Pregill 1981

KUVP 64695 *Leiocephalus partitus*, new species—Pregill 1981: p. 39; paratype; a single right dentary. This specimen originally bore the same number as *L. etheridgei*.

Quaternary, Late Pleistocene; Cuevo del Perro, Ciales Valley, about 2 kilometers south of Barrio de Barahona, Municipio de Morovis, 18°20′57″N, 66°26′47″W, Puerto Rico; collected by J. W. Bee in 1957.

Phrynosoma Wiegmann 1828

Phrynosoma adinognathus Rickart 1976

KUVP 25258 *Phrynosoma adinognathus* sp. nov.—Rickart 1976: p. 65; text-fig. 1b; holotype; proximal two-thirds of a right dentary.

KUVP 25259 *Phrynosoma adinognathus* sp. nov.—Rickart 1976: p. 65; paratype; proximal half of left dentary.

KUVP 25260 *Phrynosoma adinognathus* sp. nov.—Rickart 1976: p. 65; text-fig. 1c; paratype; distal half of right dentary.

KUVP 25261 *Phrynosoma adinognathus* sp. nov.—Rickart 1976: text-fig. 1a; referred material, a nearly complete frontal lacking posterolateral arms.

KUVP 25258-61 Quaternary, Pleistocene, Crooked Creek Formation, Borchers local fauna; east of State Lake on east side of Crooked Creek, NW¼, NE¼, Sec. 21, T33S, R28W, Meade County, Kansas; collected by C. W. Hibbard in 1939 and 1940.

Phrynosoma cf. *cornutum* (Harlan 1825)

KUVP 5099 *Eumecoides hibbardi*, n. sp.—Taylor 1941A: p. 173, text-fig. 5A-D; holotype; a nearly complete right dentary.

Phrynosoma cornutum—Estes 1983: text-fig. 8G (after text-fig. 5A-D in Taylor 1941A).

KUVP 5115 *Eumecoides mylocoelus*, n. sp.—Taylor 1941A: p. 174, text-fig. 6A-D, holotype; left dentary, missing posterior portion.

KUVP 5099, 5115 Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); about 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938. Taylor (1941A) originally referred this material to the family Scincidae. Etheridge (1960), on the basis of additional material, considered both *Eumecoides hibbardi* Taylor and *E. mylocoelus* Taylor to be conspecific with, though slightly different from, *Phrynosoma cornutum* (Harlan).

Infraorder Scincomorpha Camp 1923

Family Scincidae Gray 1825

Eumeces Wiegmann 1834

Eumeces striatulatus Taylor 1941

KUVP 5079 *Eumeces striatulatus*, n. sp.—Taylor 1941A: p. 171, text-figs. 3A-D; holotype; fragmentary right dentary.

Eumeces striatulatus—Estes 1983: text-fig. 27E (after text-fig. 3A-D in Taylor 1941A).

KUVP 65694 *Eumeces striatulatus*, n. sp.—Taylor 1941A: text-figs. 4A,B; referred material, middle portion of right dentary.

KUVP 5079, 65694 Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); about 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Family Teiidae Gray 1827

Cnemidophorus Wagler 1839

Cnemidophorus bilobatus Taylor 1941

KUVP 5084 *Cnemidophorus bilobatus*, n. sp.—Taylor 1941A: p. 167, text-fig. 1A-C; holotype; portion of left dentary, containing eight teeth.
Cnemidophorus bilobatus—Estes 1983: text-fig. 21D (after text-fig. 1A-C in Taylor 1941A).

KUVP 5081 *Cnemidophorus bilobatus*, n. sp.—Taylor 1941A: text-fig. 2B,C; referred material, fragment of anterior part of right maxilla.

KUVP 5091 *Cnemidophorus bilobatus*, n. sp.—Taylor 1941A: text-fig. 2A; referred material, anterior tip of left dentary.

KUVP 5084, 5081, 5091 Tertiary, Pliocene, Rexroad Formation (Blancan land mammal age); about 16 miles southwest of Meade, NE¼, SW¼, Sec. 22, T33S, R29E, Meade County, Kansas; collected by C. W. Hibbard and party in 1938.

Infraorder Anguimorpha Fürbringer 1900
Superfamily Diploglossa (= Anguinoidae) Cope 1864
Family Anguidae Gray 1825
Subfamily Glyptosaurinae McDowell and Bogert 1954
Helodermoides Douglass 1903
Helodermoides tuberculatus Douglass 1902

KUVP 10698 *Helodermoides tuberculatus* Douglass—Sullivan 1979: text-fig. 10i,j; nearly complete left frontal and posterior part of left prefrontal.
Peltosaurus granulosus—Estes 1983: text-fig. 37A (after text-figs. 76, 73, 78 in Gilmore 1928).
Tertiary, Oligocene, White River Formation (Orellan land mammal age), Cedar Creek Member; East Pawnee Butte, Sec. 22, T10N, R59W, Weld County, Colorado; collected by R. W. Wilson on July 11, 1956.

Peltosaurus Cope 1873
Peltosaurus granulosus Cope 1873

KUVP 1280 *Peltosaurus granulosus* Cope—Gilmore 1926: pl. 15, figs. 1-3; skull and dermal scutes.
Peltosaurus granulosus Cope—Gilmore 1928: text-figs. 73, 75–78; skull.
Peltosaurus granulosus Cope—Piveteau 1955: text-fig. 11B on p. 624 (after text-fig. 75 in Gilmore 1928).
Peltosaurus granulosus—Estes 1983: text-fig. 37A (after text-figs. 76, 73, 78 in Gilmore 1928).
Tertiary, Oligocene, Brule Formation (Orellan land mammal age), Orella Member; Hat Creek Basin, 1.5 miles west of Anderson Ranch, Sioux County, Nebraska; collected by E. R. Hall in 1922.
Gilmore listed this specimen as KUVP 1208 in the figure legends of his 1926 paper (a number currently occupied by the marine turtle *Protostega gigas*), and variably as KUVP 1208 and 1280 in his 1928 paper. He also listed KUVP 1280 as referred material and a fragmentary humerus from this same specimen as KUVP 1208 in this paper. The number KUVP 1280 is the correct citation for all of this material.

KUVP 7654 *Peltosaurus granulosus* Cope—Meszoely 1970: text-fig. 16D; skull roof and other skull elements. Erroneously cited as KUVP 620 (this is the field number).
Tertiary, Oligocene, White River Formation (Orellan land mammal age); W½, Sec. 7, T11N, R53W, Logan County, Colorado; collected by R. R. Camp on July 31, 1946.

Family Anguidae *incertae sedis*
Odaxosaurus Gilmore 1928

Odaxosaurus pawneensis (Gilmore 1928)

KUVP 1281 ?*Xestops pawneensis,* new species—Gilmore 1928: p. 150; holotype; median section of an articulated skull with the median part of the attached right ramus.

Tertiary, Oligocene, White River Formation (Orellan land mammal age); Clyde Ward Ranch, Sec. 28, T11N, R53W, 30 miles north of Sterling, Logan County, Colorado; collected by C. J. Hesse in 1925.

Due to the fragmentary nature of this specimen, Gilmore could only tentatively place it in the genus *Xestops* Cope. Meszoely (1970) erected the new genus, *Pancelosaurus* as a replacement name for *Peltosaurus*? *piger* Gilmore 1928, *P. jepseni* Gilmore 1942, and *Odaxosaurus obliquus* Gilmore 1928, all of which were conspecific, but generically distinct from *Peltosaurus* Cope, in his opinion. He chose *Peltosaurus*? *piger* as the type species of this new genus since it had page priority over *Odaxosaurus obliquus* in Gilmore's (1928) paper. However, since the genus *Odaxosaurus* Gilmore (1928) already existed as a replacement name, Meszoely's treatment, in effect, synonomized his replacement name *Pancelosaurus.* Meszoely concluded that ?*Xestops pawneensis* Gilmore (1928) should be called *Pancelosaurus pawneensis* (Gilmore), but the proper designation should be *Odaxosaurus pawneensis* (Gilmore 1928). Our placement of *Odaxosaurus* in the Anguidae, *incertae sedis,* follows Sullivan's (1979) conclusions.

KUVP 9734 *Odaxosaurus* cf. *piger* (Gilmore)—Sullivan 1981: text-fig. 4.2, anterior portion of frontal complex.

Tertiary, Middle Paleocene, Nacimiento Formation (Torrejonian land mammal age); NW¼, Sec. 14, T27N, R11W, San Juan County, New Mexico; collected by R. W. Wilson field party in 1950.

Superfamily Platynota Baur 1890
Family Helodermatidae Bonaparte 1840
Heloderma Wiegmann 1829
Heloderma matthewi Gilmore 1928

KUVP 7652 *Heloderma matthewi* Gilmore—Yatkola 1976: text-fig. 1C-E; complete right maxilla. Specimen probably lost.

Tertiary, Middle Oligocene, White River Formation (Orellan land mammal age); center of W½, Sec. 7, T11N, R53W, Logan County, Colorado; collected by R. R. Camp on August 1, 1946.

Family Mosasauridae Gervais 1853
Subfamily Mosasaurinae Williston 1897
Clidastes Cope 1868
Clidastes propython Cope 1869

KUVP 1022 *Clidastes velox* Marsh—Williston and Case 1892: pl. 2, left front paddle (image reversed); pl. 3, left hind paddle (now missing the fibula).

Clidastes velox Marsh—Williston 1893B: pl. 3, figs. 1-3; restoration of complete skeleton based primarily on KUVP 1022. Williston stated that the palatals and vomers were so distorted in KUVP 1022, that he had to refer to a specimen of *C. tortor* Cope (= *C. propython* Cope), for these cranial elements.

Clidastes velox—Williston 1895A: pl. 17, fig. 1 (after pl. 3, fig. 2 in Williston 1893B).

Clidastes velox Marsh—Williston 1898B: pls. 10-12, reconstruction of skull, based primarily on KUVP 1022; pl. 33 (after pl. 2 in Williston

and Case 1892); pl. 34 (after pl. 3 in Williston and Case 1892, but with the pelvic girdle elements rearranged); pl. 27, ?figs. 3,4, radii, ?figs. 3A, 4A, ulnae; ?pl. 31, fig. 6, coracoid and scapula; pl. 60, fig. 6, right quadrate, fig. 7, left quadrate (these specimens have not been relocated); pl. 62, fig. 3, nearly complete skeleton (image reversed); pl. 72 top figure, restoration of complete skeleton.

Clidastes—Williston 1914: text-fig. 72, top figure (redrawn from pl. 10 in Williston 1898B); text-fig. 74 (redrawn from pl. 2 in Williston and Case 1892, image reversed).

Clidastes—Lull 1917: text-fig. 69 (after Williston 1914, text-fig. 72, top figure).

Clidastes velox Marsh—Zittel 1918: text-fig. 359A (after pl. 10 in Williston 1898).

Tylosaurus proriger Cope (error)—Zittel 1918: text-fig. 359B (redrawn from pl. 11 in Williston 1898B); erroneously labled *Tylosaurus proriger.*

Clidastes—Williston 1925: text-fig. 54, top figure (after text-fig. 72, top figure in Williston 1914); text-fig. 146 (after text-fig. 74 in Williston 1914).

Tylosaurus (error)—Romer 1933: text-fig. 142A (redrawn from pl. 11 in Williston 1898B). Second edition 1945 text-fig. 169A; third edition 1966 text-fig. 204A; erroneously labled *Tylosaurus.*

Clidastes—Romer 1933: text-fig. 142B (after Williston 1914, text-fig. 72). Second edition 1945 text-fig. 169B; third edition 1966 text-fig. 204B.

Clidastes velox—Lane 1946: text-fig. 7 (redrawn from pl. 60, fig. 7 in Williston 1898B). Specimen not relocated.

Tylosaurus (error)—Romer 1956: text-fig. 65A (redrawn from pl. 11 in Williston 1898B); erroneously labeled *Tylosaurus.*

Clidastes—Romer 1956: text-fig. 65C (after pl. 3 in Williston and Case 1892); text-fig. 182f, pectoral elements (after pl. 2 in Williston and Case 1892).

Clidastes velox Marsh—Callison 1967: text-figs. 1, 9 (after pl. 10 in Williston 1898B).

Clidastes—Peyer 1968: text-fig. 102 (taken from Romer 1945, text-fig. 169).

Clidastes—Bennett 1984: text-fig. 85B (redrawn from pl. 72, top figure, Williston 1898B).

Nearly complete skeleton.

Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; Butte Creek, Logan County, Kansas; collected by S. W. Williston in the summer of 1891.

KUVP 1026 *Clidastes Westii*, n. sp.—Williston and Case 1892: p. 29-30, pl. 4; nearly complete right front paddle; pl. 5, right hind paddle, missing the terminal phalangeal elements; pl. 6, eighteenth dorsal vertebra. Holotype.

Clidastes westii Williston (error)—Williston 1898B: pl. 23, top figure, complete left mandible; pl. 27, fig. 1, radius; fig. 1A, ulna; pl. 35 (after pl. 4 in Williston and Case 1892); pl. 36 (after pl. 5 in Williston and Case 1892); pl. 39, top figures, distal ends of humerus; pl. 53 (after pl. 6 in Williston and Case 1892), listed as the thirty-eighth vertebra; pl. 60, fig. 4, right quadrate, not relocated.

Clidastes westii (error)—Camp 1923: text-fig. 22 (after Williston 1898B,

pl. 53, fig. 2).

Clidastes—Williston 1925: text-fig. 158B (redrawn from pl. 4 in Williston and Case 1892).

Lower jaw, skull parts, 84 vertebrae, ribs, front and hind paddle.

Upper Cretaceous, Campanian, Pierre Shale Formation; near McAllister, Logan County, Kansas; collected by C. H. Sternberg. Williston and Case (1892) stated the type material of *C. westi* came from, ". . . the uppermost of the Niobrara beds, in the vicinity of the old town of Sheridan" (now McAllister), in Logan County, Kansas.

KUVP 1000 *Clidastes tortor* Cope—Williston 1898B: pl. 23, lower figure, complete right mandible; pl. 27, fig. 2, radius; fig. 2a, ulna, not relocated; pl. 28, fig. 6, mandibular tooth (erroneously listed as *Platecarpus coryphaeus);* pl. 29, fig. 2, posterior cervical vertebra; pl. 37, right scapula and coracoid; pl. 38, proximal half of left front paddle; pl. 39, right-hand figure, pelvic girdle (now missing distal end of pubis); pl. 54, fig. 4, pygal vertebra, fig. 5, anterior caudal vertebrae.

Clidastes tortor Cope—Yakovlew 1901: text-fig. 1 (after pl. 23 in Williston 1898B).

Clidastes tortor Cope—Williston 1903A: text-fig. 4 (after pl. 23 in Williston 1898B).

Clidastes tortor Cope—Yakovlew 1906: text-fig. 1 (after pl. 23 in Williston 1898B).

Clidastes—Williston 1914: text-fig. 71 (after pl. 23 in Williston 1898B).

Clidastes—Williston 1925: text-fig. 58 (after pl. 23 in Williston 1898B); text-fig. 86A (redrawn from pl. 29, fig. 2 in Williston 1898B).

Clidastes—Romer 1933: text-fig. 142D (after Williston 1914, text-fig. 71). Second edition 1945 text-fig. 169D; third edition 1966 text-fig. 204D.

Clidastes—Romer 1956: text-fig. 108C (after pl. 23 in Williston 1898B).

Skull, lower jaws, quadrate, vertebral column, left scapula and coracoid, pelvic girdle, parts of front paddle, and ribs.

Upper Cretaceous, Senonian, Niobrara Chalk Formation, Smoky Hill Chalk Member; Smoky Hill River, Kansas; collected by E. P. West in 1889.

KUVP 1108 *Clidastes velox*—Williston 1898B: pl. 28, figs. 1-4.

Clidastes tortor—Williston 1898B: pl. 61, fig. 4; right quadrate.

KUVP 14278 *Clidastes tortor*—Williston 1898B: pl. 61, fig. 4; left quadrate.

KUVP ? *Clidastes tortor*—Williston 1898B: pl. 42, figs. 5,6, posterior cervical vertebrae. Specimen not relocated.

KUVP ? *Clidastes tortor*—Williston 1898B: pl. 47, left-hand figure, frontal bone. Specimen not relocated.

KUVP ? *Clidastes tortor*—Williston 1898B: pl. 64, fig. 1; left quadrate. Specimen not relocated.

KUVP 1108, 14278, ? Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

Russell (1967) considered *Clidastes velox* Marsh, *C. westi* Williston and Case, and *C. tortor* Cope, to be conspecific with *C. propython* Cope.

Clidastes sp.

KUVP 66330 *Clidastes* sp.—Williston 1898B: pl. 57, fig. 3, tibia.

KUVP 69552 *Clidastes pumilus* Marsh—Abel 1911: text-fig. 107, front paddle (drawing from a composite plaster cast, humerus reversed).

Clidastes pumilus Marsh—Abel 1919: text-fig. 529 (from Abel 1911, text-

fig. 107), front paddle.
Clidastes pumilus Marsh—Abel 1927: text-fig. 292 (from Abel 1911, text-fig. 107), front paddle.
Upper Cretaceous; western Kansas.

KUVP 14348 *Clidastes*—Callison 1967: text-fig. 3, occipital fragment of skull; text-fig. 5, skull roof; text-fig. 8-3, 4b, right stapes. Specimens not relocated.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

Mosasaurus Conybeare 1822
Mosasaurus ivoensis Persson 1963

KUVP 1024 *Clidastes stenops* Cope—Williston 1902C: pl. 12, lower figure, portion of front paddle, missing several phalangeal elements.
Mosasaurus ivoensis—Russell 1967: text-fig. 79, anterior portion of muzzle.
Partial skull, ribs, pelvic girdle, front and hind paddle.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, western Kansas; collected by C. H. Sternberg.
Russell (1967) referred this material, originally identified by Williston (1902C) as *C. stenops* Cope, to *M. ivoensis* Persson.

Mosasaurus missouriensis (Harlan 1834)

KUVP 1034 *Mosasaurus horridus*—Williston 1895A: p. 166, holotype; "nearly the entire skull, the larger part of a front paddle, and about forty vertebrae"; pls. 14, 15, skull; pl. 16, fig. 1, left front paddle; fig. 2, right quadrate.
Mosasaurus horridus Williston—Williston 1898B: pls. 19-21, skull; pl. 32 (after pl. 16, figs. 1,2 in Williston 1895A).
Mosasaurus horridus Williston—Shor 1971: plate on p. 49 (after pl. 14 in Williston 1895A).
Nearly complete skull, eight vertebrae, portions of the left front paddle.
Upper Cretaceous, Campanian, Pierre Shale Formation; Cheyenne River, Custer County, South Dakota; collected by S. W. Williston and the KU Geological Expedition in the summer of 1894.
Russell (1967) considered *M. horridus* Williston indistinguishable from, and a junior synonym of, *M. missouriensis* (Harlan).

Subfamily Plioplatecarpinae (Dollo 1894)
Platecarpus Cope 1869
Platecarpus coryphaeus (Cope 1872)

KUVP ? *Platecarpus caryphaeus* (error) Cope—Williston 1897E: pl. 20, lower figure, restoration of skull. Specimen not relocated. Composite?
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP ? *Platecarpus coryphaeus*—Williston 1898B: pl. 13 (after pl. 20 in Williston 1897E); pls. 14, 15, reconstruction of skull, probably a composite of several specimens; pl. 22, left mandible; pl. 24, fig. 4, postorbitofrontal; pl. 25, figs. 1,2, left maxilla; fig. 3, prefrontal; figs. 4,5, transverse bones; pl. 28, mandibular tooth; pl. 29, fig. 4, anterior end of vomer; fig. 5, indeterminate bones; pl. 52, fig. 3, right lateral piece of atlas; pl. 54, fig. 3, pygal vertebra; pl. 56, figs. 1,2,4, femora; pl. 57, fig. 5, fibula; fig. 6, metatarsal; fig. 8-10 in center, carpals; pl. 58, fig. 3, radius; fig. 6, ulna; fig. 7, radial carpal; fig. 8,

ulnar carpal; figs. 9,10, distal carpals; pl. 63, fig. 1, parietal; fig. 2, petrosals; fig. 5, odontoid; fig. 6, atlantar intercentrum; figs. 7,8, lateral pieces of atlas; fig. 11, articuloangular; pl. 72, middle figure, restoration of complete skeleton, a composite based upon several specimens (mostly KUVP 1007). None of these specimens have been relocated.

Platecarpus—Williston 1914: text-fig. 72, middle figure (redrawn from pl. 15 in Williston 1898B). Specimen not relocated.

Mosasaur—Moodie 1923; pl. 40, magnified cross-section of diseased radius; pl. 48, figs. A, B, diseased radius; figs. C, D, diseased dorsal vertebrae. Specimens not relocated.

Platecarpus—Williston 1925: text-fig. 54, middle figure (after pl. 72, middle figure in Williston 1914).

Platecarpus—Romer 1933: text-fig. 142C (after Williston 1914, text-fig. 72). Second edition 1945 text-fig. 169C; third edition 1966 text-fig. 204C.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 66337 *Platecarpus coryphaeus*—Williston 1898B: pl. 24, fig. 1, right pterygoid.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1001 *Platecarpus coryphaeus*—Williston 1898B: pl. 24, fig. 5; pl. 63, fig. 3, left jugal.

Platecarpus coryphaeus—Williston 1899A: pl. 12, cartilaginous tracheal rings erroneously described as a "nuchal fringe," and cervical ribs. Nearly complete skeleton.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Gove County, Kansas; collected by S. W. Williston and party in the summer of 1898.

KUVP ? *Platecarpus coryphaeus*—Williston 1898b: pl. 24, figs. 2,3, premaxilla. Specimen not relocated, if not part of KUVP 1007.

KUVP ? *Platecarpus coryphaeus*—Williston 1898B: pl. 26, fig. 1, parietal; figs. 2,3, frontal. Specimens not relocated, if not part of KUVP 1007.

KUVP 66336 *Platecarpus coryphaeus*—Williston 1898B: pl. 26, fig. 4; pl. 63, fig. 4, left prosquamosal.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1007 *Platecarpus coryphaeus*—Williston 1898B: pl. 27, top figure; rear view of complete skull; pl. 29, fig. 3, sclerotic plates; ? pl. 31, figs. 4,5, pygal vertebrae; ? pl. 52, fig. 2, ulna; pl. 63, fig. 9, coronoid; pl. 72, middle figure, restoration of complete skeleton, a composite based upon several specimens.

Platecarpus coryphaeus Cope—Zittel 1902: text-fig. 244 (after pl. 27, top figure in Williston 1898B). Second English edition 1932: text-fig. 435.

Platecarpus coryphaeus Cope—Zittel 1902: text-fig. 250 (after pl. 72, middle figure in Williston 1898B). Second English edition 1932: text-fig. 442.

Platecarpus—Williston 1914: text-fig. 73 (after pl. 27, top figure in Williston 1898B).

Platecarpus coryphaeus Cope—Zittel 1918: text-fig. 360 (redrawn from pl. 27, top figure in Williston 1898B).

Platecarpus—Williston 1925: text-fig. 57 (after pl. 27, top figure, in

Williston 1898B).
Platecarpus—Williams 1975: Cover picture.
Platecarpus—Bennett 1984: text-fig. 85C (redrawn from pl. 72, middle figure, Williston 1898B).
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, western Kansas; collected by E. P. West in 1890.

KUVP 66335 *Platecarpus coryphaeus*—Williston 1898B: pl. 28, fig. 7, mandibular tooth.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1131 *Platecarpus coryphaeus*—Williston 1898B: pl. 28, fig. 8,8a,8b, radius; pl. 41, fig. 2, pubis; fig. 2a, ischium; pl. 45, fig. 1,1a,b, radius.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Gove County, Kansas; collected by S. W. Williston on June 3, 1891.

KUVP 66333 *Platecarpus coryphaeus*—Williston 1898B: pl. 31, fig. 7. Specimen not identified in plate explanation.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP ? *Platecarpus coryphaeus*—Williston 1898B: pl. 42, figs. 3,4, median dorsal vertebrae. Specimens not relocated.

KUVP 1011 *Platecarpus coryphaeus*—Williston 1898B: pl. 46, figs. 1-4; pl. 52, fig. 1, left humerus; pl. 58, figs. 1, 4, radii, not relocated.
Scapula, humerus, radius.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1042 *Platecarpus coryphaeus*—Williston 1898B: pl. 51, fig. 1, right humerus; fig. 2, left coracoid; fig. 3, right scapula; fig. 4, left humerus; fig. 5, carpal; fig. 6, radius; fig. 7, cervical hypapophysis (not numbered on photograph); figs. 8,9, cervical ribs; figs. 10-12, thoracic ribs; fig. 13, ossified cartilage.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; Smoky Hill River, either Logan or Gove Counties, Kansas; collected by E. P. West.

KUVP 1041 *Platecarpus coryphaeus*—Williston 1898B: pl. 54, fig. 2, pygal vertebra.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, western Kansas; collected by E. P. West.

KUVP 1171 *Platecarpus coryphaeus*—Williston 1898B: pl. 57, fig. 4, tibia.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown but probably near Elkader, Gove County, Kansas; collected by E. E. Slosson on June 2, 1891.

KUVP 1172 *Platecarpus coryphaeus*—Williston 1898B: pl. 56, figs. 3,5.
Mosasaur—Moodie 1917: fig. 18.
Platecarpus coryphaeus—Moodie 1918: fig. 15.
Mosasaur—Moodie 1923: pl. 34 (after fig. 18, in Moodie 1917). Exostosial radius, carpus, and part of the metacarpus. Specimen not relocated.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Gove County, Kansas; collected by S. W. Williston on June 2, 1891.

KUVP 66332 *Platecarpus coryphaeus*—Williston 1898B: pl. 57, figs. 8-10 (lower left-

hand corner), tarsals (specimen in fig. 10 not relocated).
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1167? *Platecarpus coryphaeus*—Williston 1898B: pl. 57, fig. 7, fifth metatarsal.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Logan County, Kansas; collected by S. W. Williston on June 27, 1891.

KUVP 1132 *Platecarpus coryphaeus*—Williston 1898B: pl. 58, fig. 2, radius; fig. 5, ulna.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Logan County, Kansas; collected by E. C. Case on June 30, 1891.

KUVP 14285 *Platecarpus coryphaeus*—Williston 1898B: pl. 60, fig. 3, left quadrate.
Platecarpus coryphaeus—Lane 1946: text-fig. 6 (redrawn from pl. 60, fig. 3 in Williston 1898).
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1178 *Platecarpus coryphaeus*—Williston 1898B: pl. 61, fig. 3, right scapula.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1194 *Platecarpus coryphaeus*—Williston 1898B: pl. 63, fig. 10, surangular.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Gove County, Kansas; collected by S. W. Williston in June of 1891.

KUVP 1004 *Platecarpus coryphaeus* Cope—Williston 1902C: pl. 12, upper figure, nearly complete hind paddle.
Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; South Fork of Solomon River, 3 miles northwest of Hill City, Sec. 17, T8S, R23W, Graham County, Kansas; collected by S. W. Williston in 1895.

KUVP ? *Platecarpus coryphaeus*—Sternberg 1909: text-fig. 10, skull; no longer in collection.
Platecarpus coryphaeus—Abel 1927: text-fig. 295 (after Sternberg 1909 text-fig. 10), skull.
Upper Cretaceous, Niobrara Formation, Smoky Hill Chalk Member; western Kansas.

KUVP 1081 *Platecarpus coryphaeus* Cope—Callison 1967: text-fig. 7, left quadrate, four vertebrae, rib fragments.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Wallace County, Kansas; collected by G. P. Cooper.

Platecarpus ictericus (Cope 1871)

KUVP 1142 *Platecarpus ictericus*—Williston 1898B: pl. 43, scapula and coracoid (coracoid is now missing some pieces).

KUVP ? *Platecarpus ictericus*—Williston 1898B: pl. 44, front paddle.

KUVP 1142, ? Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, western Kansas; collected by S. W. Williston.

Platecarpus sp.

KUVP ? *Platecarpus* sp.—Williston 1895A: pl. 17, fig. 3, reconstruction of skull, probably a composite of several specimens.

KUVP 66329 *Platecarpus* sp.—Williston 1898B: pl. 45, fig. 2,2A,B, tibia (?).

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP ? *Platecarpus* sp.—Williston 1898B: pl. 57, figs. 1,2, radii. Specimens not relocated.

KUVP 1051 *Platecarpus*—Moodie 1923: pl. 41a, lower figure, pl. 41c, right-hand specimen, diseased metatarsal; pl. 41a, top figure (specimen not relocated); pl. 41b, diseased terminal phalanges; pl. 41c, upper right-hand figure, diseased terminal phalanx, upper left-hand and center figures (specimens not relocated).

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, western Kansas; collected by E. P. West.

Prognathodon Dollo 1889

Prognathodon overtoni (Williston 1897)

KUVP 950 Undescribed genus *Overtoni*—Williston 1895A: p. 169, no figures; holotype.

Brachysaurus overtoni Williston—Williston 1897C: p. 96; pl. 8, fig. 1,1a, mandibular tooth; fig. 2, fragmentary frontal; fig. 3, quadrate; fig. 4,4a, posterior cervical vertebra; fig. 5, medial caudal vertebra, not relocated; fig. 6, humerus; fig. 7, paddle bone.

Brachysaurus overtonii (error) Williston—Williston 1898B: pl. 22, top figure, nearly complete left lower mandible and fragments of the anterior portion of right upper maxilla (tip of mandible is now missing); pl. 30 (after pl. 8, figs. 1-7 in Williston 1897C). Plate 40, figs. 10,11, indeterminate bones; pl. 62, fig. 1, humerus; fig. 2, coracoid.

Fragmentary skull, upper and lower jaw, quadrate, ribs, 16 vertebrae, humeri, coracoid, and two paddle bones.

Upper Cretaceous, Campanian, Pierre Shale Formation; Cheyenne River, Custer County, South Dakota; collected by T. R. Overton with the KU Geological Expedition in the summer of 1894.

Williston (1895A) recognized this material as probably generically distinct from *Mosasaurus*, but declined to refer it to any known genus. He did, however, erect the name *overtoni* at that time. In 1897C he tentatively proposed the generic name, *Brachysaurus*. Schmidt (1927) stated that the name *Brachysaurus* is preoccupied by the iguanid genus *Brachysaurus* Hallowell and proposed a replacement name, *Ancylocentrum*. Russell (1967) considered *Ancylocentrum* Schmidt (= *Brachysaurus* Williston) to be conspecific with *Prognathodon* Dollo.

Subfamily Tylosaurinae Williston 1897

Tylosaurus Marsh 1872

Tylosaurus proriger (Cope 1869)

KUVP 1075 *Liodon* Owen (*Tylosaurus* Marsh)—Snow 1877: plate on p. 55, impression of dermal scales; text-fig. on p. 57, outline drawing of right front paddle.

Tylosaurus—Williston 1897D: text-fig. 1, outline drawing of front paddle; pl. 9, front paddle and ribs, in matrix; pl. 10, hind paddle bones, in matrix; pl. 11, left pelvis, in matrix; pl. 12, dermal scale impressions.

Tylosaurus proriger—Williston 1898B: pl. 48, left-hand figure (after fig. 1 in Williston 1897D); right-hand figure (after pl. 9 in Williston 1897D); pl. 49 (after pl. 11 in Williston 1897D); pl. 50 (after pl. 10 in Williston 1897D); pl. 68, entire specimen, in matrix; pl. 69 (after pl.

on p. 55 in Snow 1877); pl. 70 (after pl. 12 in Williston 1897D), image is reversed.

Tylosaurus—Williston 1914: text-fig. 75 (after pl. 9 in Williston 1897D); fig. 78 (after pl. 12 in Williston 1897D).

Tylosaurus—Williston 1925: text-fig. 148 (after text-fig. 75 in Williston 1914).

Tylosaurus proriger—Shor 1971: plate on p. 48 (after pl. 69 in Williston 1898B).

Two front paddles, ribs, pelvic girdle, 20 vertebrae, impression of dermal scales.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; Hackberry Creek, Gove County, Kansas; collected by F. H. Snow and L. L. Dyche in 1877.

KUVP ? *Tylosaurus proriger* Cope—Williston 1898B: pls. 16-18, reconstruction of skull (pl. 16 after pl. 20, top figure in Williston 1897E); pl. 72 (after pl. 13, fig. 3, in Williston 1897G) reconstruction of skeleton. Reconstruction of skull and skeleton from several specimens.

Tylosaurus proriger Cope—Zittel 1918: text-fig. 359C (redrawn from pl. 18 in Williston 1898B).

Tylosaurus—Williston 1914: pl. 72, lower figure (redrawn from pl. 17 in Williston 1898B).

Tylosaurus proriger—Abel 1919: text-fig. 531 (redrawn from pl. 18 in Williston 1898B).

Tylosaurus—Williston 1925: text-fig. 54, lower figure (after text-fig. 72, lower figure in Williston 1914).

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 66334 *Tylosaurus proriger*—Williston 1898B: pl. 29, fig. 1, mandibular tooth.

Tylosaurus—Williston 1914: text-fig. 70, image reversed (after pl. 29, fig. 1 in Williston 1898B).

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1195 *Tylosaurus proriger*—Williston 1898B: pl. 40, fig. 1, femur; fig. 3, right ischium; fig. 4, left ischium; also includes thirty-one vertebrae and a skull fragment.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Logan County, Kansas; collected by E. C. Case on June 30, 1891.

KUVP ? *Tylosaurus proriger*—Williston 1898B: pl. 40, fig. 2, ilium; fig. 6, radius; fig. 7, metacarpal. Specimens not relocated.

KUVP 1017 *Tylosaurus proriger*—Williston 1898B: pl. 41, fig. 1a, left ilium; fig. 1b, pubis; fig. 1c, ischium.

Pelvic girdles.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1029 *Tylosaurus proriger*—Williston 1898B: pl. 40, fig. 5, femur; fig. 8, ulna; fig. 9 radius.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; Smoky Hill River, either Logan or Gove Counties, Kansas; collected by E. P. West in 1890.

KUVP 1016 *Tylosaurus proriger*—Williston 1898B: pl. 55, fig. 1, radius; fig. 2, humerus; fig. 3, coracoid; fig. 4, cartilage.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk

Member; exact locality and collector unknown, western Kansas.

KUVP 1020 *Tylosaurus proriger*—Williston 1898B: pl. 60, fig. 1, right quadrate; fig. 2, left quadrate.

Tylosaurus proriger—Lane 1946: text-fig. 5 (redrawn from pl. 60, fig. 2 in Williston 1898B).

Cranial fragments, quadrates, paddle elements.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; Smoky Hill River, either Logan or Gove Counties, Kansas; collected by E. P. West in 1890.

KUVP 1189 *Tylosaurus proriger*—Williston 1898B: pl. 64, fig. 2, left quadrate; fig. 3, anterior caudal vertebrae in matrix (fig. reversed); material in pl. 64 erroneously listed as *Platecarpus coryphaeus;* pl. 65, posterior thoracic and anterior dorsolumbar vertebrae and ribs, in matrix.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Gove County, Kansas; collected by S. W. Williston on June 1, 1891.

KUVP 1013 *Tylosaurus proriger*—Williston 1898B: pl. 66, posterior caudal vertebrae; pl. 67, terminal caudal vertebrae.

Twenty-eight vertebrae.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

Tylosaurus indet.

Tylosaurus dyspelor (Cope 1871) *nomen dubium*

KUVP 1014 *Tylosaurus dyspelor*—Williston 1898B: pl. 41, figs. 4,5, posterior cervical vertebra.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP ? *Tylosaurus dyspelor*—Williston 1898B: pl. 42, figs. 1,2, pygal vertebra; pl. 59, fig. 1, humerus; fig. 2, radius; fig. 6, phalangeal element. Specimens not relocated.

KUVP 1117 *Tylosaurus dyspelor*—Williston 1898B: pl. 59, fig. 3, ulna; figs. 4-5, 7-8, metacarpals and phalangeal elements.

Pieces of skull, 44 vertebrae, bones of front and hind paddles.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Gove County, Kansas; collected by E. P. West.

KUVP 1032 *Tylosaurus dyspelor*—Williston 1898B: pl. 61, figs. 1 (image reversed), 2, left quadrate.

Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; mouth of 12 Mile Creek, on the Smoky Hill River, Logan County, Kansas; collected by E. P. West.

Russell (1967) declined to refer *Tylosaurus dyspelor* to either of the two species of Niobrara *Tylosaurus, nepaeolicus* or *proriger.* Instead, he regarded the name *dyspelor* as a *nomen vanum,* and also stated that the holotype is probably a junior synonym of *T. proriger* (Cope).

Tylosaurus sp.

KUVP ? *Tylosaurus* sp.—Williston 1895A: pl. 17, fig. 2, reconstruction of skull, probably a composite of several specimens.

KUVP 1015 *Tylosaurus* sp.—Williston 1898B: pl. 54, fig. 1, pygal vertebrae.

Upper Cretaceous, Campanian, Pierre Shale Formation, Sharon Springs Member?; exact locality unknown, Wallace County, Kansas; collected by S. W. Williston in 1891.

Mosasauridae indet.

KUVP 6176 Mosasaur—Martin and Stewart 1977: text-fig. 1A, four dorsal vertebrae and some unidentified fragments.
Upper Cretaceous, Turonian, Carlile Shale Formation, Blue Hill Shale Member; near Medicine Peak, Osborn County, Kansas; collected by A. Graffham.

KUVP 27032 Mosasaur—Martin and Stewart 1977: text-fig. 1B, two caudal vertebrae.
Upper Cretaceous, Turonian, Carlile Shale Formation, Blue Hill Shale Member; NW¼, Sec. 19, T11S, R17W, Ellis County, Kansas; collected by J. D. Stewart in 1973.

KUVP 25869 Mosasaur—Martin and Stewart 1977: text-fig. 1C, posterior tip of right maxilla.
Upper Cretaceous, Turonian, Carlile Shale Formation, Fairport Chalk Member; E½, Sec. 19, T11S, R17W, Ellis County, Kansas; collected by J. D. Stewart in 1975.

Suborder Serpentes Linnaeus 1758
Family Boidae Bonaparte 1831
Geringophis Holman 1976
Geringophis vetus Holman 1982

KUVP 49126 *Geringophis vetus* sp. nov.—Holman 1982: p. 490, text-fig. 1; holotype; trunk vertebra.
Tertiary, Oligocene, Brule Formation (Late Orellan land mammal age); NE¼, Sec. 8, T33N, R53W, Toadstool Park, Sioux County, Nebraska; collected by L. Martin and O. Bonner field party in 1970's.

Infraorder Henophidia *incertae sedis*
Helagras Cope 1883
Helagras orellanensis Holman 1983

KUVP 49127 *Helagras orellanensis* n. sp.—Holman 1983: p. 417; text-fig. 1; holotype; trunk vertebra.

KUVP 49128 *Helagras orellanensis* n. sp.—Holman 1983: p. 417; text-fig. 2; paratype; two fused vertebrae of juvenile.
Tertiary, Middle Oligocene, Brule Formation (Orellan land mammal age); Toadstool Park area near Orella, Sioux County, Nebraska, anthill collections; collected by L. Martin, O. Bonner field party in 1970's.

Suborder Amphisbaenia Cope 1864
Family Amphisbaenidae Gray 1825
Hyporhina Baur 1893
Hyporhina galbreathi Taylor 1951

KUVP 8221 *Hyporhina galbreathi* sp. nov.—Taylor 1951: p. 532, text-fig. 2A-C; pl. 58, figs. 6-8; holotype; a nearly complete skull, missing quadrate, part of squamosal and lower jaws.
Hyporhina galbreathi—Estes 1983: text-fig. 49A (after text-fig. 2A-C in Taylor 1951).

KUVP 8219 *Hyporhina galbreathi* sp. nov.—Taylor 1951: text-fig. 3A,B; pl. 59, fig. 5; referred material, fragmentary skull with cast of braincase, lacking jaws.

KUVP 8222 *Hyporhina galbreathi* sp. nov.—Taylor 1951: pl. 59, fig. 4; referred material, fragmentary skull, missing lower jaws.

KUVP 8219, 8221, 8222 Tertiary, Middle Oligocene, White River Formation (Orellan land mammal age); Cedar Creek Member; Clyde Ward Ranch, SE¼,

SW¼, Sec. 12, T11N, R54W, 35 miles northwest of Sterling, Logan County, Colorado; collected by E. C. Galbreath in 1948.

Rhineura Cope 1861
Rhineura amblyceps Taylor 1951

KUVP 7649 *Rhineura amblyceps* sp. nov.—Taylor 1951: p. 543; text-fig. 5A-C; pl. 61, figs. 1-3; holotype; basal portion of skull, missing jaws. Erroneously listed by Taylor in fig. 5 as KUVP 7469.

KUVP 7650 *Rhineura amblyceps* sp. nov.—Taylor 1951: text-fig. 6A-C; pl. 62, figs. 1-3; referred material, fragmentary braincase, missing jaws.

KUVP 7649-50 Tertiary, Middle Oligocene, White River Formation (Orellan land mammal age), Cedar Creek Member, *Oreodon* beds; Clyde Ward Ranch, W½, Sec. 7, T11N, R53W, about 35 miles northwest of Sterling, Logan County, Colorado; collected by R. R. Camp (C. W. Hibbard field party) on July 29 and July 31, 1946, respectively.

KUVP 9041 *Rhineura amblyceps* sp. nov.—Taylor 1951: pl. 59, fig. 1; pl. 61, figs. 4,5; fragmentary skull, lacking jaws.
Tertiary, Middle Oligocene, White River Formation (Orellan land mammal age), Cedar Creek Member; Clyde Ward Ranch, W½, Sec. 7, T11N, R53W; about 35 miles northwest of Sterling, Logan County, Colorado; collected by E. C. Galbreath in 1948.

Rhineura hatcheri Baur 1893

KUVP 8220 *Rhineura hatcheri* Baur—Taylor 1951: pl. 65, figs. 1-3; nearly complete skull, lacking jaws.
Tertiary, Middle Oligocene (Orellan land mammal age); SE¼, Sec. 21, T11N, R53W, Logan County, Colorado; collected by R. W. Wilson (E. C. Galbreath Field Party) in 1948.

KUVP 8960 *Rhineura hatcheri* Baur—Taylor 1951: pl. 66, figs. 1-3; nearly complete skull with jaws.
Tertiary, Middle Oligocene, White River Formation (Orellan land mammal age), Cedar Creek Member; Clyde Ward Ranch, NE¼, SE¼, Sec. 3, T11N, R54W, Logan County, Colorado; collected by E. C. Galbreath in 1949.

Rhineura wilsoni Taylor 1951

KUVP 7651 *Rhineura wilsoni* sp. nov.—Taylor 1951: p. 548, text-fig. 7A-C; pl. 63, figs. 1-3; holotype; nearly complete skull, lacking squamosal, quadrate, columella, extra-columella, and lower jaws. Erroneously listed in text-fig. 7 and pl. 63 as KUVP 7649.
Rhineura wilsoni—Estes 1983: text-fig. 50C (after text-fig. 7A-C in Taylor 1951).
Tertiary, Middle Oligocene, White River Formation (Orellan land mammal age), Cedar Creek Member; Clyde Ward Ranch, NW¼, Sec. 7, T11N, R53W, about 35 miles northwest of Sterling, Logan County, Colorado; collected by R. R. Camp (C. W. Hibbard field party) on July 31, 1946.

Superorder Archosauria Cope 1869
Order Thecodontia Owen 1859
Suborder Pseudosuchia Zittel 1887-1890
Infraorder Parasuchia Huxley 1875
Family Parasuchidae Lydekker 1885
Angistorhinus Mehl 1913
Angistorhinus aeolamnis Eaton 1965

KUVP 11659 *Angistorhinus aeolamnis* Eaton n. sp.—Eaton 1965: p. 4, text-figs. 1A-C, 2A,B; holotype; a nearly complete skull lacking lower jaws.
Angistorhinus aeolamnis—Charig et al. 1976: text-fig. 8C, palatal view of skull (redrawn from Eaton 1965).
Upper Triassic, Chugwater Formation, Popo Agie Member; 23 miles northwest of Lander via U.S. Highway 287 and 11 miles west of Highway 287 on Sage Creek Road, SE¼, Sec. 14, T1N, R3W, Fremont County, Wyoming; collected by University of Kansas field party during the summer of 1960.

KUVP 11660 *Angistorhinus* sp.—Eaton 1965: text-fig. 2C; fragment of the interorbital skull roof.
Collected at the type locality of *A. aeolamnis* Eaton by R. D. Platz during the summer of 1960.

Order Crocodylia Gmelin 1788
Suborder Mesosuchia Huxley 1875
Family Goniopholididae Cope 1875
Goniopholis Owen 1841 (= *Hyposaurus* Owen 1849)
Goniopholis sp.

KUVP 66331 Crocodile—Williston 1894: pl. 1, fig. 5, single vertebra.
Crocodile—Williston 1898A: text-fig. 4 (after pl. 1, fig. 5 in Williston 1894).
Williston tentatively placed this vertebra in the crocodilian genus *Hyposaurus* Cope. This specimen was originally cataloged as KUVP 829.
Lower Cretaceous, Albian, Kiowa Formation; Clark County, Kansas.

Order Pterosauria Kaup 1834
Suborder Pterodactyloidea Plieninger 1901
Family Pteranodontidae Marsh 1876
Pteranodon Marsh 1876
Pteranodon ingens (Marsh 1872)

KUVP 929 *Pteranodon* sp.—Williston 1892: text-fig. 1, prepubic bones.
Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Logan County, Kansas; collected by E. P. West.

KUVP 2212 *Pteranodon* sp.—Williston 1892: pl. 1, nearly complete skull, lacking medial portion of lower jaw.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, but probably on Smoky Hill River, near Elkader, Logan County, Kansas; collected by E. C. Case and S. W. Williston with the Kansas University Geological Expedition during the summer of 1891.

KUVP ? *Ornithostoma ingens*—Williston 1893A: text-fig. on p. 80, composite reconstruction of pelvic girdle and left hind limb, too generalized to identify specimens.
Ornithostoma ingens M.—Williston 1897A: text-fig. on p. 49 (from fig. on p. 80 in Williston 1893A).
No locality data.

KUVP 974 *Ornithostoma*—Williston 1895B: pl. 1, fig. 1, reconstruction of posterior half of mandible.
Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Logan County, Kansas; collected by H. T. Martin.

KUVP 976 *Ornithostoma*—Williston 1896: pl. 1, figs. 1,2, posterior half of skull.
Pteranodon sp.—Huene 1914: text-fig. 8, posterior half of skull.
Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Logan County, Kansas; collected by C. H. Sternberg.

KUVP 966 *Ornithostoma species*—Williston 1897A: text-fig. on p. 42, sternum.

KUVP 2212 *Ornithostoma ingens* M.—Williston 1897A: pl. 2, restoration of complete skeleton based on several specimens (skull is based on KUVP 2212).

KUVP 966, 2212 Cretaceous, Cenomanian or Santonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Trego County, Kansas; collected by H. T. Martin.

Order Saurischia Seeley 1888
Suborder Sauropodomorpha Huene 1932
Infraorder Sauropoda Marsh 1878
Family Camarasauridae Cope 1877
Subfamily Camarasaurinae Nopcsa 1928
Camarasaurus Cope 1877 (=*Morosaurus* Marsh 1878)
Camarasaurus sp.?

KUVP 1354 *Morosaurus grandis*—Williston 1898D: text-figs. 1,2, sacrum.
Upper Jurassic; exact locality unknown, but probably north of Lusk, Converse (now Niobrara) County, Wyoming; collected by the Kansas University Geological Expedition in 1895.

Family Atlantosauridae Marsh 1877
Subfamily Atlantosaurinae Steel 1970
Atlantosaurus Marsh 1877 (=*Apatosaurus* Marsh 1877)
Atlantosaurus sp.?

KUVP ? Sauropodus dinosaur—Moodie 1916: fig. 1.
Apatosaurus—Moodie 1917: text-fig. 14; text-fig. 16, microscopic section.
Apatosaurus—Moodie 1918: text-figs. 12 and 13 (after text-figs. 14 and 16 respectively in Moodie 1917).
Apatosaurus—Moodie 1923: pl. 29, fig. b; pls. 30-33 contain macroscopic and microscopic sections of bone tumor.
Apatosaurus lonisae Holland (error)—Wells 1964: pl. 33 (photograph from cast in Wellcome Historical Museum, London).
Two diseased caudal vertebrae. Specimen not relocated.
Upper Jurrasic (published as Comanchian=Lower Cretaceous), Como Beds; Carbon County, Wyoming.

Suborder Theropoda Marsh 1881
Infraorder Carnosauria Huene 1920
Family Megalosauridae Huxley 1869
Allosaurus Marsh 1877
Allosaurus sp.

KUVP 1392 *Allosaurus*—Williston 1901A: text-fig. on p. 113, pectoral girdle and a portion of the limb.
Jurassic; exact locality unknown, Freeze Out Mountains, Carbon County, Wyoming; collected by S. W. Williston with the Kansas University Geological Expedition during the summer of 1899.

Order Ornithischia Seeley 1888

Suborder Ankylosauria Osborn 1923
Family Nodosauridae Marsh 1890
Silvisaurus Eaton 1960
Silvisaurus condrayi Eaton 1960
(Type-species)

KUVP 10296 *Silvisaurus condrayi*, n. gen., n. sp.—Eaton 1960: p. 5; holotype; text-figs. 1-3, skull; text-fig. 4A, maxillary tooth; text-fig. 4B, premaxillary tooth; text-fig. 5, braincase; text-fig. 6, left ramus of mandible; text-figs. 7,8, cervical vertebrae; text-fig. 9, cervical rib; text-fig. 10, thoracic vertebra; text-fig. 11, thoracic rib; text-figs. 12, 13, caudal vertebrae; text-fig. 14, sacrum and presacral rod; text-fig. 15, right femur; text-fig. 16, left pubis; text-fig. 17, terminal phalanx; text-fig. 18a,b, dermal spine; text-figs. 19, 20, dermal plates.

Ostrom (1970, p. 114) argued that the specimen in fig. 16, tentatively identified by Eaton (1960), is not a pubis and closely resembles a sternal bone.

Lower Cretaceous, Albian, Dakota Formation, Terra Cotta Clay Member; SW1/4, Sec. 8, T10S, R1W, Ottawa County, Kansas; collected by R. R. Camp in July of 1955.

Suborder Ceratopsia Marsh 1890
Family Ceratopsidae Marsh 1888
Pentaceratops Osborn 1923
Pentaceratops cf. *sternbergi* Osborn 1923

KUVP 16100 *Pentaceratops* cf. *sternbergii* (error)—Rowe et al. 1981: text-fig. 2.3, skull with rear portion of frill.

Pentaceratops—Jenkinson, M.A. 1970: text-fig. on page 24.

Upper Cretaceous, Maastrichtian, Fruitland Formation; NW1/4, NW1/4, Sec. 3, T23N, R13W, San Juan County, New Mexico; collected by C. Kerfoot in July 1965.

Superorder Euryapsida Colbert 1945
Order Sauropterygia Owen 1859
Suborder Plesiosauria Blainville 1835
Superfamily Plesiosauroidea Nopcsa 1928
Family Elasmosauridae Cope 1869
Elasmosauridae indet.
Ogmodirus martini Williston and Moodie 1913, *nomen dubium*
(Type-species)

KUVP 441 *Ogmodirus martini*—Williston and Moodie 1913: p. 121, no figures; holotype; 51 consecutive cervical vertebrae, 18 ribs, neural spines, pectoral and pelvic girdle elements, limb elements.

Ogmodirus martinii Williston and Moodie (error)—Moodie 1916: text-figs. 1,4, left femur; pl. 1, figs. 1,2,4 humerus; fig. 3, femur cross section. None of these specimens have been relocated.

Ogmodirus martinii (error)—Williston and Moodie 1917: text-fig. 1, pl. 1, cervical vertebrae in series; text-fig. 2, humerus (not relocated); pl. 2, left front paddle (most of the elements have not been relocated); pl. 3, fig. 1, right humerus; fig. 2, distal end of humerus; fig. 3, section of femur; fig. 4, proximal end of humerus (all after pl. 1, figs. 1-4 in Moodie 1916) (not relocated); pl. 4, fig. 1, left femur (not relocated); fig. 2, neural spines; fig. 3, right ilium (not relocated); fig. 4, fragment of pubis (not relocated); fig. 5, cervical vertebra.

Upper Cretaceous, Lower Turonian or Upper Cenomanian, Greenhorn Formation; exact locality unknown, near Aurora, Cloud County, Kansas; collected by C. Boyce in 1909.

Welles (1943) compared *Ogmodirus martini* Williston and Moodie to *Leurospondylus ultimus* Brown, which it closely resembles, and concluded that proportional differences in the vertebrae and propodials of *Ogmodirus* were of sufficient magnitude to warrant generic distinction. However, in 1962, he stated, "The specimen is so young that its relationships are not determinable. It could be the young of any of the known adults; so the name is a *nomen "vanum."* Williston and Moodie (1917) recorded this specimen from the Niobrara or the "Benton"; based on the locality and adhering matrix, the material is almost certainly from the Greenhorn Formation.

Elasmosaurus ischiadicus (Williston 1903), *nomen dubium*

KUVP 434

Polycotylus ischiadicus—Williston 1903A: holotype; pl. 10, right-hand figure, a series of seven caudal vertebrae (erroneously listed as cervical vertebrae—see Welles 1952:86). Williston also listed the second vertebra from the bottom of the figure as a sacral vertebra in pl. 26 of this publication. Plate 26, ischia, ilia, sacral rib, caudal vertebra; and a portion of a femur. Sacral ribs, ischia, and ilia in pl. 26 have not been relocated. Additional, unfigured vertebrae include: 3 presacrals, 4 sacrals and 5 more caudals.

Thalassiosaurus ischiadicus (Williston) n. gen.—Welles 1943: text-fig. 34, ischia (not relocated), after Williston 1903A, pl. 26 (erroneously attributed to Williston 1906).

Thalassiosaurus ischiadicus (Williston)—Welles 1952: text-fig. 12, ischia and proximal end of right femur (ischia not relocated).

Upper Cretaceous, Santonian, Niobrara Formation, Smoky Hill Chalk Member; Plum Creek, Logan County, Kansas; collected by B. F. Mudge and S. W. Williston in 1874.

Williston (1903A) originally placed this material in the genus *Polycotylus*, on the basis of its vertebral proportions, but states that, "There is no assurance, . . . , that they belong in this genus, . . . , they may belong with the type species, *P. latipinnis*, or they may belong to some unrecognized genus." It was later referred to the genus *Elasmosaurus* (Williston 1906, 1908) on the basis of ischial shape, but Williston and Moodie (1917) disputed this arrangement and stated that it may belong to the genus *Ogmodirus* Williston and Moodie. Welles (1943) erected the new genus *Thalassiosaurus* based on this material with *T. ischiadicus* as the type-species. Lane (1946) erroneously listed KUVP 1327 as the holotype of *T. ischiadicus*. Welles (1952) listed this as *Ogmodirus ischiadicus* in his synonymy, but in 1962, as *Elasmosaurus ischiadicus*. In 1962, he also concluded that the material is juvenile, inadequate, and not diagnostic and should therefore be considered a *nomen "vanum."*

Elasmosaurus snowi (Williston 1890), *nomen dubium*

KUVP 1301

Cimoliosaurus Snowii (error)—Williston 1890A: p. 267, no figures; holotype; a nearly complete skull, mandibles, and twenty-eight associated vertebrae.

Cimoliosaurus (*Elasmosaurus*?) *Snowii* Will. (error)—Williston 1890B: text-fig. on p. 174, skull; text-fig. on p. 176, third cervical vertebra.

Cimoliasaurus snovii Willist. (error)—Cope 1894: text-fig. on p. 110 (redrawn from fig. on p. 174 of Williston 1890B).

Cimoliasaurus snowii Wil. (error)—Williston 1903A: text-fig. 13 (redrawn from fig. on p. 174 in Williston 1890B); pl. 5, fig. 5, left mandible.

Cimoliasaurus—Williston 1904: text-fig. 16 (after text-fig. 13 in Williston 1903A).

Elasmosaurus—Williston 1914: text-fig. 40 (redrawn from text-fig. 174 in Williston 1890B).

Elasmosaurus—Williston 1925: text-fig. 48a (after text-fig. 40 in Williston 1914).

Styxosaurus snowii (Williston) (error)—Welles 1952: text-fig. 5, skull.

Elasmosaurus snowi Williston—Huene 1956: text-fig. 444 (redrawn from text-fig. 13 in Williston 1903A).

Styxosaurus snovii (Williston) (error)—Novozhilov 1964: fig. 314A and B (after fig. 5 in Welles 1952).

Styxosaurus snovii (Williston) (error)—Müller 1968: text-fig. 219 (after text-fig. 5 in Welles 1952).

Welles (1962) considered the name *Styxosaurus snowii* (Williston) a *nomen "vanum"* formed when in 1943 he erected this new generic name for a taxon previous workers already referred to as *Elasmosaurus snowi* (Williston). He concluded the material is elasmosaurian but not diagnostic.

Upper Cretaceous, ?Santonian, Niobrara Formation, Smoky Hill Chalk Member; Hell Creek, Logan County, Kansas; collected by E. P. West in 1890. Welles (1943) erroneously listed the type locality as "Plum County, Kansas."

Plesiosaurus gouldi Williston 1897, *nomen dubium*

KUVP 1306 *Cimoliosaurus* n. sp. (error)—Williston 1894: pl. 1, figs. 1-2, single cervical vertebra. In 1897B, Williston stated that this vertebra probably belongs to *P. gouldi* Williston or another closely related species of *Plesiosaurus*.

Lower Cretaceous, Albian, Kiowa Formation; vicinity of Upper Bluff and Sand Creeks, near Ashland, Clark County, Kansas; collected by C. N. Gould and S. W. Williston in 1894.

KUVP 1302 Elasmosaur, g. et sp. indet.—Welles 1952: p. 107; three posterior cervical, two pectoral, and two anterior dorsal centra.

Although not figured by Welles, the material should be noted since, according to the KUVP catalogue, it originally bore the same KUVP number as the type material of *Elasmosaurus sternbergi* Williston. Welles identified this material as that of a giant elasmosaur of indeterminate affinity.

Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Logan County, Kansas; collected by C. H. Sternberg in 1895. Welles (1952) erroneously lists H. T. Martin as the collector.

Plesiosaurus mudgei Cragin 1894, *nomen dubium*

KUVP ? *Plesiosaurus mudgei*, sp. nov.—Cragin 1894: p. 69; pl. 1, figs. 1-3, holotype; a single dorsal centrum. Specimen not relocated.

Lower Cretaceous, Albian, Kiowa Formation (cited as Fredricksburg); Blue Cut Hill, southeastern Kiowa County, Kansas; collected by A. L. Diamond.

Welles (1952) concluded that the single dorsal centrum figured and described by Cragin in 1894 is probably elasmosaurian. The propodial is

probably pliosaurian, as is the scapula figured by Williston (1930A). According to Welles, this species must be considered a *nomen "vanum,"* and its allocation to the genus *Plesiosaurus* is incorrect.

KUVP ? *Plesiosaurus mudgei*—Williston 1903A: text-fig. 11, scapulo-clavicular girdle (composite restoration), probably based on text-fig. 6 (see page 56) and pl. 27, fig. 1 in Williston 1903A.

Plesiosaurus mudgei(?) Cragin—Williston 1903A: pl. 27, fig. 1, episternum and portion of the clavicles. Specimen not relocated.

Cretaceous; exact locality unknown, western Kansas.

KUVP 1305 *Plesiosaurus mudgei* Cragin—Williston 1903A: pl. 29, nine vertebrae, fragmentary femur, and about 200 gastroliths. Of this material, only three of the vertebrae have been relocated.

Lower Cretaceous, Albian, Kiowa Formation; exact locality unknown, Clark County, Kansas; collected by C. N. Gould in 1893.

Superfamily Pliosauroidea Welles 1943
Family Polycotylidae Williston 1908
Dolichorhynchops Williston 1902
Dolichorhynchops osborni Williston 1902

KUVP 1300 *Dolichorhynchops osborni* Willist.—Williston 1902B: p. 243-44; holotype; pl. 11, a nearly complete skeleton with skull.

Dolichorhynchops osborni—Williston 1903A: text-fig. 3, occipital view of skull; text-fig. 5, portion of left mandible; text-fig. 8, pectoral girdle; text-fig. 12, pelvic girdle; pl. 1 (after pl. 11 in Williston 1902B); pl. 2, pl. 3, figs. 1, 2, pl. 4, figs. 1, 2, skull; pls. 6-9, series of cervical vertebrae; pl. 10, left-hand figure, distal caudal vertebrae; pl. 11, thoracic and abdominal ribs; pl. 12, pectoral girdle elements; pl. 13, pectoral girdle elements and humerus, pl. 14, 15, pectoral girdle; pl. 16, pubic bones; pl. 17, right ischium and ilium; pl. 20, right pectoral and pelvic paddles; pl. 22, fig. 5, atlantar-axial complex.

Dolichorhynchus osborni—Sternberg 1909 and 1931: text-fig. 20 (after pl. 11 in Williston 1902B).

Trinacromerum osborni—Williston 1914: text-fig. 32 (after pl. 11 in Williston 1902B); text-fig. 35, restoration of pectoral girdle; text-fig. 36, restoration of pelvic girdle; text-fig. 38B,C (redrawn from pl. 20 in Williston 1903A); text-fig. 41 (redrawn from pl. 3, fig. 2 in Williston 1903A).

Trinacromerum Osborni Williston (error)—Zittel 1918: text-fig. 400 (redrawn from text-fig. 36 in Williston 1914).

Trinacromerum osborni—Williston 1925: text-fig. 48C (after text-fig. 41 in Williston 1914); text-fig. 80A (redrawn from pl. 22, fig. 5 in Williston 1903A, image reversed): text-fig. 80O (redrawn from pl. 11 in Williston 1903A); text-fig. 102 (redrawn from fig. 35 in Williston 1914); text-fig 125 (redrawn from text-fig. 36 in Williston 1914); text-fig. 159B,C (after text-fig. 38B,C in Williston 1914); text-fig. 174 (after pl. 11 in Williston 1902B).

Trinacromerum osborni Williston—Zittel 1932: text-fig. 404 (redrawn from text-fig. 36 in Williston 1914).

Trinacromerum osborni—Lane 1946: text-fig. 3; complete skeleton.

Trinacromerum Cragin—Huene 1956: text-fig. 459E (redrawn from text-fig. 35 in Williston 1914)—also figured are a skull and front paddle; these are probably based on University of Kansas material but

comparison is difficult.

Trinacromerum—Romer 1956: text-fig. 120O (redrawn from text-fig. 80 in Williston 1925); text-fig. 148C (redrawn from text-fig. 102 in Williston 1925); text-fig. 159B (redrawn from text-fig. 125 in Williston 1925); text-fig. 186C (redrawn from text-fig. 159C in Williston 1925, image reversed); text-fig. 194B (redrawn from text-fig. 159B in Williston 1925, image reversed).

Dolichorhynchops osborni Williston—Welles 1962: text-fig. 13A, left humerus; text-fig. 13B, pectoral girdle; text-fig. 13C, left femur; text-fig. 13D, pelvic girdle (all figures redrawn from Williston 1903A); text-fig. 23 (a reduction of text-fig. 13 in Welles 1962).

Dolichorhynochops (error)—Bennett 1984: text-fig. 87A, drawing of complete skeleton.

Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Logan County, Kansas; collected by C. H. Sternberg in 1901.

Dolichorhynchops willistoni (Riggs 1944)

KUVP 5070 *Trinacromerum willistoni* sp. nov.—Riggs 1944: p. 77, holotype; text-fig. 1, skull; text-fig. 2, atlanto-axial complex; text-fig. 3, scapula; text-figs. 4,5, fragmentary clavicles and interclavicle; text-fig. 6, right coracoid; text-fig. 7, fragmentary pelvic girdle; text-fig. 8, fragmentary pelvic bones (pubis and ischium); other type material includes approximately fifty vertebrae.

Upper Cretaceous, Cenomanian or Turonian, Greenhorn Formation, Hartland Shale Member; road cut on U.S. Hwy. 81, south of Concordia, Sec. 16, T6S, R3W, Cloud County, Kansas; collected by road crew in December of 1936.

Welles (1962) considered the genus *Trinacromerum* Cragin to be based upon non-diagnostic material and consequently transferred *T. willistoni* Riggs to the genus *Dolichorhynchops*.

Dolichorhynchops indet.

KUVP 1325 *Trinacromerum anonymum* n. sp.—Williston 1903A: p. 66, holotype; text-fig. 9, episternum; pl. 28, ten associated cervical vertebrae, propodial, parts of illim and coracoid. Unfigured portion of holotype includes 16 vertebrae, 2 phalanges and fragments.

Upper Cretaceous, Turonian, Benton Limestone Formation; near Paradise Creek, NW¼, Sec. 20, T11S, R14W, Russell County, Kansas; collected by B. F. Mudge in 1873.

Welles (1962) considered this material non-diagnostic and the name a *nomen "vanum,"* thus representing an indeterminate form within the genus *Dolichorhynchops*.

Polycotylidae *indet.*

Elasmosaurus sternbergi Williston 1906, *nomen dubium*

KUVP 1312 *Elasmosaurus sternbergi* n. sp.—Williston 1906: p. 232, no figures; holotype; two complete dorsal vertebrae and additional fragments.

Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Gove County, Kansas; collected by C. H. Sternberg in 1895.

The KUVP catalogue lists this holotype as KUVP 1302, however, Welles (1952) found that material numbered as KUVP 1302 consisted of seven vertebrae and, proportionally, were very different from the measurements

provided by Williston (1906). See KUVP 1302 account for more information. The correct number for this material is KUVP 1312. Based on the measurements in Williston (1906), Welles concluded that this material is pliosaurian not elasmosaurian and of indeterminate affinity.

Plesiosaurus gulo Cope 1872, *nomen dubium*

KUVP 1329 *Plesiosaurus gulo*—Cope 1872: p. 128, no figures; holotype; "eleven cervical, thirteen dorsal, and seven or eight other vertebrae, with portions of the scapular and pelvic arch, and ribs."

Plesiosaurus gulo Cope—Williston 1903A: text-fig. 7, ventral extremity of scapula.

Lower Cretaceous, Kiowa Formation?; collected by J. Savage.

Cope reported that this material is from the Niobrara or Pierre Formation, near Sheridan (now McAllister), Logan County, Kansas. The type of preservation strongly indicates that this is incorrect. *P. gulo* is not from the Niobrara and probably not from the Pierre Shale. Kiowa Formation is likely but this formation does not occur in Logan County.

Welles (1952) stated that the figure in Williston (1903A), if it is a scapular fragment, may be pliosaurian, whereas if it is the distal border of the coracoid, it is probably elasmosaurian. In any case, the material is not diagnostic and *P. gulo* Cope is a *nomen "vanum."*

Specimens catalogued as KUVP 1329 are mostly poorly preserved and probably include several taxa. This material consists of more than 40 vertebral centra and other fragments, including the piece of "scapula" figured by Williston (1903A). It is not possible to separate the type from other material with certainty.

Plesiosaurus gouldi Williston 1897, *nomen dubium*

KUVP ? *Plesiosaurus Gouldii* n. sp. (error)—Williston 1897B: p. 57, no figures; holotype; several nearly complete dorsal vertebrae. Specimens not relocated.

Plesiosaurus gouldii (error)—Williston 1903A: pl. 27, figs. 2,3, dorsal vertebra. Specimen not relocated.

Confusion exists as to what constitutes the holotype of *P. gouldi* and consequently where this species should be placed within the Plesiosauria. The type consists of several nearly complete dorsal vertebrae. According to Welles (1952, p. 1-6) measurements of one of these vertebrae (Williston 1897B, p. 57; 1903A, p. 13) indicate it is an elasmosaur. However, the description published by Williston in these same papers appears to match the specimen figured and labeled by him as the holotype (pl. 27, figs. 2,3). Measurements taken from this figure indicate this material is from a pliosaur (Welles 1952, p. 116). Because Welles (1952) believed (based on Williston's published measurements) that the holotype of *P. gouldi* is from an elasmosaur, he did not consider the vertebra figured by Williston (1903A) as part of the holotype; *P. gouldi* is therefore Dolichorhynchopidae indet.

Lower Cretaceous, Albian, Kiowa Formation; exact locality unknown, Clark County, Kansas; collected by C. N. Gould.

Polycotylus latipinnis Cope 1869, *nomen dubium*

KUVP 5916 *Polycotylus latipinnis* Cope—Williston 1903A: pl. 21, right pelvic paddle (published as pectoral paddle).

Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Smoky Hill River, east of

Fort Wallace, Wallace County, Kansas; collected by G. R. Allman.

Pliosauroidea indet.

KUVP ? *Cimoliosaurus* sp. (error)—Williston 1894: pl. 1, fig. 3, propodial. Specimen not relocated.
Probably pliosaurian (Welles 1952, p. 116).
Lower Cretaceous, Albian, Kiowa Formation; vicinity of Upper Bluff and Sand Creeks, near Ashland, Clark County, Kansas; collected by C. N. Gould and S. W. Williston in 1894.

KUVP ? *Plesiosaurus mudgei*—Cragin 1894: pl. 1, fig. 4, fragmentary propodial (femur?), tentatively referred to *P. mudgei* by Cragin; propodial element is probably pliosaurian.
Lower Cretaceous, Albian, Kiowa Formation (cited as Fredericksburg); Blue Cut Hill, southeastern Kiowa County, Kansas; collected by A. L. Diamond.

KUVP 7545 *Plesiosaurus mudgei* Cragin—Williston 1903A: text-fig. 6, portion of the right scapula.
Lower Cretaceous, Albian, Kiowa Formation; exact locality unknown, Clark County, Kansas; collected by C. N. Gould.
Welles (1952) stated that this scapula is probably pliosaurian.

Plesiosauria indet.

KUVP 1314 "young plesiosaurs"—Williston 1903A: pl. 23, fig. 4, juvenile propodial.
"*Polycotylus* and *Elasmosaurus*"—Moodie 1911: pl. 1, fourth specimen from right-hand side.

KUVP 1315 "young plesiosaurs"—Williston 1903A: pl. 23, fig. 3, juvenile propodial.

KUVP 1314-5 Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, western Kansas.

KUVP 1323 "*Polycotylus* and *Elasmosaurus*"—Moodie 1911: pl. 1, first specimen on left-hand side; juvenile propodial (humerus); material also includes five carpal elements.
Upper Cretaceous, Santonian or Campanian, Niobrara Formation, Smoky Hill Chalk Member; exact locality unknown, Wallace County, Kansas; collected by Kansas University Geological Expedition during the summer of 1895.

KUVP ? "plesiosaurian propodial"—Moodie 1911: text-figs. 1,2,3; pl. 1 right-hand specimen, embryonic propodial. Specimen not relocated.
plesiosaurian—Moodie 1916: text-fig. 5, embryonic plesiosaurian propodial (from text-fig. 1 in Moodie 1911).
Cretaceous, Niobrara Formation, Smoky Hill Chalk Member; exact locality and collector unknown, probably western Kansas.

KUVP ? plesiosaur—Moodie 1911: text-figs. 4,5, juvenile propodial; figs. 8,9, mature propodial. Specimens not relocated.
plesiosaurian *(Polycotylus)*—Moodie 1916: text-fig. 3, propodial (redrawn from text-fig. 4 in Moodie 1911).
Probably Cretaceous of western Kansas; no other data.

KUVP ? *Polycotylus*—Moodie 1911: text-fig. 6, nearly mature propodial; fig. 7, mature propodial. Specimens not relocated.
Probably Cretaceous of western Kansas; no other data.

KUVP ? "*Polycotylus* and *Elasmosaurus*"—Moodie 1911: pl. 1, second, third, fifth and sixth specimens from the left, propodials. Specimens not relocated.
Probably Cretaceous of western Kansas; no other data.

KUVP ? plesiosaurian—Moodie 1916: text-fig. 2, distal end of embryonic pro-

podial. Specimen not relocated.
Probably Cretaceous of western Kansas; no other data.

Subclass Theropsida Seeley 1896
Order Pelycosauria Cope 1878
Suborder Sphenacodontia Marsh 1878
Family Sphenacodontidae Marsh 1878
Thrausmosaurus Fox 1962
Thrausmosaurus serratidens Fox 1962
(Type-species)

KUVP 11120 *Thrausmosaurus serratidens* new genus and new species—Fox 1962: p. 302; holotype; text-fig. 4, fragmentary left dentary.

KUVP 11121 *Thrausmosaurus serratidens* new genus and new species—Fox 1962: text-fig. 5, fragmentary left (?) maxilla (referred specimen). Specimen not relocated.

KUVP 11122 *Thrausmosaurus serratidens* new genus and new species—Fox 1962: text-fig. 6, fragmentary left dentary (referred specimen). Specimen not relocated.

KUVP 11120-22 Lower Permian, Wichita Group, Wellington Formation, fissure fills within the Ordovician Arbuckle Limestone; Dolese Brothers limestone quarry at Richards Spur, just west of U.S. Hwys. 62 and 281, 10.5 miles south of Apache, 6 miles north of Fort Sill, SW½, Sec. 31, T4N, R11W, Comanche County, Oklahoma.

Suborder Edaphosauria Cope 1882
Family Nitosauridae Romer and Price 1940
Delorhynchus Fox 1962
Delorhynchus priscus Fox 1962
(Type-species)

KUVP 11117 *Delorhynchus priscus* new genus and new species—Fox 1962: p. 299; holotype; text-fig. 1, fragmentary left maxilla.

KUVP 11118 *Delorhynchus priscus* new genus and new species—Fox 1962: text-fig. 2, fragmentary right maxilla (referred specimen).

KUVP 11119 *Delorhynchus priscus* new genus and new species—Fox 1962: text-fig. 3, fragmentary left maxilla (referred specimen).

KUVP 11117-9 Lower Permian, Wichita Group, Wellington Formation, fissure fills within the Ordovician Arbuckle Limestone; Dolese Brothers limestone quarry at Richards Spur, just west of U.S. Hwys. 62 and 281, 10.5 miles south of Apache, 6 miles north of Fort Sill, SW½, Sec. 31, T4N, R11W, Comanche County, Oklahoma.

Family Edaphosauridae Cope 1882
Edaphosaurus Cope 1882
Edaphosaurus sp.

KUVP 1425 *Petrolacosaurus*—Lane 1945: text-fig. 2, a nearly complete pelvis.
Petrolacosaurus kansensis Lane—Peabody 1952: text-fig. 5, left half of pelvis. Listed by Peabody as the topotype of *P. kansensis* Lane. Reisz et al. (1982), stated that KUVP 1425 was mistakenly assigned to *Petrolacosaurus* by Peabody in his 1952 paper, but subsequently referred to *Edaphosaurus ecordi* in Peabody's 1957 publication.
Collected by H. H. Lane in 1931 or 1932.

KUVP 59037 Undescribed edaphosaurian pelycosaur—Reisz et al. 1982: text-fig. 4, articulated presacral vertebral column, partial, skull and humerus.

Pelycosaur—Bennett 1984: text-fig. 62.
Reisz et al. stated that this material probably belongs to the genus *Edaphosaurus*.

KUVP 1425, 59037 Upper Pennsylvanian, Missourian, Stanton Formation, Rock Lake Member; six miles northwest of Garnett, Sec. 32, T19S, R19E, Anderson County, Kansas; collected by F. E. Peabody in 1954.

Pelycosauria *incertae sedis*
Xyrospondylus Reisz et al. 1982
Xyrospondylus ecordi (Peabody 1957)
(Type-species)

KUVP 9963 *Edaphosaurus ecordi*, n. sp.—Peabody 1957: p. 947; holotype; text-fig. 1, a complete posterior cervical vertebra.
Xyrospondylus ecordi n. gen.—Reisz et al. 1982; text-fig. 3, holotype.
Upper Pennsylvanian, Missourian, Stanton Formation, Rock Lake Member; six miles northwest of Garnett, Sec. 32, T19S, R19E, Anderson County, Kansas.

Reptilia *incertae sedis*
Apatomerus Williston 1903
Apatomerus mirus Williston 1903
(Type-species)

KUVP 1198 Crocodile—Williston 1894A: pl. 1, fig. 4, femur.
Crocodile—Williston 1898A: text-fig. 3 (after pl. 1, fig. 4 in Williston 1894).
Apatomerus mirus, gen. et sp. nov.—Williston 1903B: p. 160; holotype; femur.
Lower Cretaceous, Albian, Kiowa Formation; vicinity of Bluff and Sand Creeks, near Ashland, Clark County, Kansas; collected by C. N. Gould in 1893.
Williston questionably identified this femur as belonging to a crocodile, however, in a later paper Williston (1903B) identified this femur as representing a new type of pterosaur. He erected the genus and species *Apatomerus mirus* based on this specimen. Wellnhofer (1978) stated that this material resembles *Pteranodon* in overall shape, but *Apatomerus* is distinctly different in being larger in size and thicker boned than this genus. He was unable to determine its affinities. We doubt the assignment to pterosaurs as a whole.

LITERATURE CITED

Abel, O. 1911. Grundzüge der Palaeobiologie der Wirbeltiere. xv + 708 pp. Schweizerbart, Stuttgart.

Abel, O. 1919. Die Stämme der Wirbeltiere. xviii + 914 pp. Berlin and Leipzig.

Abel, O. 1927. Lebensbilder aus der Tierwelt der Vorzeit. 2. ed. viii + 714 pp. G. Fischer, Jena.

Adams, L. A., and H. T. Martin. 1929. A new urodele from the Pliocene of Kansas. Amer. J. Sci., 5. ser, 102:504–520.

Adams, L. A. and H. T. Martin. 1930. An addition to the urodele fauna of Kansas from the Lower Pliocene. Univ. Kansas Sci. Bull. 19:289-292.

Adler, K. 1968. Synonymy of the Pliocene turtles *Pseudemys hilli* Cope and *Chrysemys limnodytes* Galbreath. J. Herpet. 1:32–38.

Auffenberg, W. 1963. Fossil testudinine turtles of Florida genera *Geochelone* and *Floridemys*. Bull. Florida State Mus. 7:53–97.

Auffenberg, W. 1974. Checklist of fossil land tortoises (Testudinidae). Bull. Florida State Mus., Biol. Sci. 18:121–251.

Baird, D. 1963. Fossil footprints or stump holes? Trans. Kansas Acad. Sci. 66:397–400.

Bennett, D. K. 1984. Fossils (pp. 96–162). In: Buchanan, R. (ed.): Kansas Geology. Univ. Kansas Press, Lawrence, Kansas. xi + 208 pp.

Bolt, J. R. 1974. Evolutionary and functional interrelationship of some suture patterns in Paleozoic labyrinthodont amphibians and other lower tetrapods. J. Paleont. 48:434–458.

Callison, G. 1967. Intracranial mobility in Kansas

mosasaurs. Univ. Kansas Paleont. Contrib. 26:1–15.

Camp, C. C. 1923. Classification of the lizards. Bull. American Mus. Natur. Hist. 48:289–481.

Carroll, R. L. 1969. Problems of the origin of reptiles. Biol. Rev. 44:393–432.

Carroll, R. L. 1975. The early differentiation of diapsid reptiles. Coll. Internat. C.N.R.S., no. 218, Problèmes actuels de paléontologie—Évolution des vertébrés: 433–449.

Carroll, R. L. 1977. The origin of lizards. In: Andrews, S. M., Miles, R. S. & Walker, A. D. (eds.): Problems in Vertebrate Evolution. Linn. Soc. Symp. Ser. No. 4:359–396.

Carroll, R., and P. Gaskill. 1978. The Order Microsauria. Mem. Amer. Philos. Soc. 126: viii + 1–211.

Case, E. C. 1897. On the osteology and relationship of *Protostega*. J. Morph. 14:21–60.

Case, E. C. 1898. *Toxochelys*. Univ. Geol. Surv. Kansas 4:370–385.

Case, E. C. 1902. On some vertebrate fossils from the Permian beds of Oklahoma. Second Biennial Rep., Dept. Geol. Natur. Hist., Territory of Oklahoma, 1901–1902:62–68.

Case, E. C. 1907. Revision of the Pelycosauria of North America. Publ. Carnegie Inst. Washington 55:1–176.

Case, E. C. 1911A. A revision of the Cotylosauria of North America. Publ. Carnegie Inst. Washington 145:1–122.

Case, E. C. 1911B. Revision of the Amphibia and Pisces of the Permian of North America. Publ. Carnegie Inst. Washington 146:1–176.

Charig, A. J., B. Krebs, H. O. Sues, and F. Westphal. 1976. Theocodontia. In: Kuhn, O. (ed.): Handbuch der Paläoherpetologie. Vol. 13:1–137. Fischer, Stuttgart, New York.

Chatterjee, S. 1982. Phylogeny and classification of thecodontian reptiles. Nature 295:317–320.

Coldiron, R. 1978. *Acroplous vorax* Hotton (Amphibia, Saurerpetontidae), restudied in light of new material. Amer. Mus. Novitates, No. 2662:1–27.

Cope, E. D. 1872. [Description of *Plesiosaurus gulo* and of the turtle afterwards named *Toxochelys latiremis*.] Proc. Acad. Natur. Sci. Philadelphia 1872:127–129.

Cope, E. D. 1886. A giant armadillo from the Miocene of Kansas. Amer. Naturalist 20:1044–1046.

Cope, E. D. 1889. The Edentata of North America. Amer. Naturalist 23:657–664.

Cope, E. D. 1894. On the structure of the skull in the plesiosaurian reptilia and on two new species from the Upper Cretaceous. Proc. Amer. Philos. Soc. 33:109–113.

Cragin, F. W. 1894. Vertebrate from the Neocomian shales of Kansas. Colorado College Studies 5:69–73.

Daly, E. 1976. A new dissorophoid labyrinthodont amphibian from Hamilton, Kansas. Trans. Kansas Acad. Sci. 79:100.

Eaton, T. H. 1960. A new armored dinosaur from the Cretaceous of Kansas. Univ. Kansas Paleont. Contrib., Vertebrata, Art. 7:1–92.

Eaton, T. H. 1962. Adaptive features of the fore limb in primitive tetrapods and mammals. Amer. Zool. 2:157–160.

Eaton, T. H. 1965. A new Wyoming phytosaur. Univ. Kansas Paleont. Contrib., Pap. 2:1–6.

Eaton, T. H. 1973. A Pennsylvanian dissorophid amphibian from Kansas. Occ. Pap. Mus. Natur. Hist., Univ. Kansas, No. 14:1–8.

Eaton, T. H., and P. L. Stewart. 1960. A new order of fishlike Amphibia from the Pennsylvanian of Kansas. Univ. Kansas Publ. Mus. Natur. Hist. 12:217–240.

Ernst, C., and R. W. Barbour. 1972. Turtles of the U.S. Univ. Kentucky Press, Lexington. 347 pp.

Estes, R. 1981. Gymnophiona, Caudata. In: Wellnhofer, P. (ed.): Handbuch der Paläoherpetologie. Vol. 2: 1–115. Fischer, Stuttgart, New York.

Estes, R. 1983. Sauria terrestria, Amphisbaenia. In: Wellnhofer, P. (ed.): Handbuch der Paläoherpetologie. Vol. 10A: 1–249. Fischer, Stuttgart, New York.

Etheridge, R. 1960. The Pliocene lizard genus *Eumecoides* Taylor. Bull. South. California Acad. Sci. 59:62–69.

Fox, R. C. 1962. Two new pelycosaurs from the lower Permian of Oklahoma. Univ. Kansas Publ. Mus. Natur. Hist. 12:297–307.

Fox, R. C. 1964. The adductor muscles of the jaw of some primitive reptiles. Univ. Kansas Publ. Mus. Natur. Hist. 12:657–680.

Fox, R. C., and M. C. Bowman. 1966. Osteology and relationships of *Captorhinus aguti* (Cope) (Reptilia: Captorhinomorpha). Univ. Kansas Paleont. Contrib., Vertebrata, Art. 11:1–79.

Gaffney, E. S. 1975. A phylogeny and classification of the higher categories of turtles. American Mus. Natur. Hist., Bull. 155:387–436.

Gaffney, E. S. 1979. Comparative cranial morphology of Recent and fossil turtles. Amer. Mus. Natur. Hist., Bull. 164:67–376.

Gaffney, E. S., and M. C. McKenna. 1979. A late Permian captorhinid from Rhodesia. Amer. Mus. Novitates, No. 2688:1–15.

Galbreath, E. C. 1948. A new extinct emydid turtle from the Lower Pliocene of Oklahoma. Univ. Kansas Publ. Mus. Nat. Hist. 1:265–280.

Gehlbach, F. R. 1965. Amphibians and reptiles from the Pliocene and Pleistocene of North America: A chronological summary and selected bibliography. Texas J. Sci. 17:56–70.

Gilbert, J. Z. 1898. On the skull of *Xerobates* (?) *undata* Cope. Kansas Univ. Quart., Ser. A., 7:143–148.

Gilmore, C. W. 1926. On a nearly complete lizard skull from the Oligocene of Nebraska. Univ. Kansas Sci. Bull. 16:229–233.

Gilmore, C. W. 1928. Fossil lizards of North America. Nat. Acad. Sci. 3rd Mem. 22:1–201.

Gregory, J. T., F. E. Peabody, and L. Price. 1956. Revision of the Gymnarthridae, American Permian microsaurs. Bull. Peabody Mus. Natur. Hist. 10: 77 pp.

Hattin, D. E. 1957. Depositional environment of the Wreford megacyclothem (Lower Permian) of

Kansas. State Geol. Surv. Kansas Bull. 24: 1–150.

Hay, O. P. 1899. On the nomenclature of certain American fossil vertebrates. Amer. Geologist 24:345–349.

Hay, O. P. 1902. Bibliography and catalogue of the fossil vertebrata of North America. Bull. U.S. Geol. Surv. 179:1–868.

Hay, O. P. 1905. A revision of the species of the family of fossil turtles called Toxochelyidae, with descriptions of two new species of *Toxochelys* and a new species of *Porthochelys*. Amer. Mus. Natur. Hist., Bull. 21:177–185.

Hay, O. P. 1908. The fossil turtles of North America. Carnegie Inst. Washington Publ. 75:1–568.

Heaton, M. J. 1980. The Cotylosauria: A reconsideration of a group of archaic tetrapods. In: Panchen, A. L. (ed.): The Terrestrial Environment and the Origin of Land Vertebrates: 497–551. Academic Press, London and New York.

Hibbard, C. W. 1944. A new land tortoise, *Testudo riggsi*, from the Middle Pliocene of Seward County, Kansas. Univ. Kansas Sci. Bull. 30:71–76.

Holman, J. A. 1963. Anuran sacral fusions and the status of the Pliocene genus *Anchylorana* Taylor. Herpetologica 19:160–166.

Holman, J. A. 1982. *Geringophis* (Serpentes:Boidae) from the Middle Oligocene of Nebraska. Herpetologica 38(4):489–492.

Holman, J. A. 1983. A new species of *Helagras* (Serpentes) from the Middle Oligocene of Nebraska. J. Herpetology 17(4):417–419.

Holmes, R. 1977. The osteology and musculature of the pectoral limb of small captorhinids. J. Morph. 152:101–140.

Hotton, N. 1959. *Acroplous vorax*, a new and unusual labyrinthodont amphibian from the Kansas Permian. J. Paleont. 33:161–178.

Huene, F. v. 1914. Beiträge zur Kenntnis des Schädels einiger Pterosaurier. Geol. Paläont. Abh., N. F. 1, H.1:57–65.

Huene, F. v. 1925. Ein neuer Pelycosaurier aus der unteren Permformation Sachsens. Geol. Paläont. Abh. 18 (N.F.14):215–264.

Huene, F. v. 1956. Paläontologie und Phylogenie der niederen Tetrapoden. Gustav Fischer-Verlag, Jena. 716 pp.

Jenkinson, M. A. (ed.). 1970. Niobrara 1968–69. Annual report of the University of Kansas Museum of Natural History. 32 pp.

Kuhn, O. 1965. Die Amphibien. System und Stammesgeschichte. 102 pp. (Oeben), Krailling/München.

Kuhn, O. 1969. Cotylosauria. In: Kuhn, O. (ed.): Handbuch der Paläoherpetologie, Vol. 6: 1–90. G. Fischer, Stuttgart, New York.

Kuhn, O. 1972. Seymouria, usw. In: Kuhn, O. (ed.): Handbuch der Paläoherpetologie. Vol. 5B:20–69. G. Fischer, Stuttgart, New York.

Kuhn-Schnyder, E. 1980. Observations on temporal openings of reptilian skulls and the classification of reptiles. In: Jacobs, L. L. (ed.): Aspects of vertebrate history. pp. 153–175. Museum of Northern Arizona Press.

Lane, H. H. 1932. A new stegocephalian from the Pennsylvanian of Arkansas. Univ. Kansas Sci. Bull. 20:313–317.

Lane, H. H. 1945A. New Mid-Pennsylvanian reptiles from Kansas. Trans. Kansas Acad. Sci. 47: 381–390.

Lane, H. H. 1945B. A survey of the fossil vertebrates of Kansas. Part II. Amphibia. Trans. Kansas Acad. Sci. 48:286–316.

Lane H. H. 1946. A survey of the fossil vertebrates of Kansas. Part III: The Reptiles. Trans. Kansas Acad. Sci. 49:289–332.

Lull, R. S. 1917. Organic Evolution. i-xviii + 729 pp. Macmillan, New York.

McDowell, S. B., Jr. 1964. Partition of the genus *Clemmys* and related problems in the taxonomy of the aquatic Testudinidae. Proc. Zool. Soc. London 143:239–279.

McFarland, W. N., F. H. Pough, T. J. Cade, and J. B. Heiser. 1979. Vertebrate life. Macmillan, New York, pp. 875.

Martin, H. T. 1922. Indications of a gigantic amphibian in the Coal Measures of Kansas. Kansas Univ. Sci. Bull. 13:103–114.

Martin, L. D., and J. D. Stewart. 1977. The oldest (Turonian) mosasaurs from Kansas. J. Paleont. 51:973–975.

Meszoely, C. 1966. North American fossil Cryptobranchid salamanders. Amer. Midland Naturalist 75:495–515.

Meszoely, C. 1970. North American fossil anguid lizards. Bull. Mus. Comp. Zool. Harvard Univ. 139:87–150.

Milner, A. R. 1978. A reappraisal of the early Permian amphibians *Memonomenos dyscuton* and *Cricotillus brachydens*. Palaeontology 21:667–686.

Mlynarski, M. 1976. Testudines. In: Kuhn, O. (ed.): Handbuch der Paläoherpetologie. Vol. 7: vi + 1–130. Fischer, Stuttgart, New York.

Moodie, R. L. 1910. The temnospondylous amphibia and a new species of *Eryops* from the Permian of Oklahoma. Univ. Kansas Sci. Bull. 5:235–253.

Moodie, R. L. 1911. An embryonic plesiosaurian propodial. Trans. Kansas Acad. Sci. 23: 95–101.

Moodie, R. L. 1916. The structure and growth of the plesiosaurian propodial. J. Morph. 27:401–410.

Moodie, R. L. 1917. Studies in Paleopathology. 1. General consideration of the evidences of pathologic conditions found among fossil animals. Ann. Med. Hist. 1917:374–393.

Moodie, R. L. 1918. Paleontological evidences of the antiquity of disease. Scient. Monthly 7: 265–281.

Moodie, R. L. 1923. Paleopathology. An introduction to the study of ancient evidences of disease. Univ. Illinois Press, Urbana. 567 pp.

Müller, A. H. 1968. Lehrbuch der Paläozoologie. Vol. 3: Vertebraten. Teil 2: i-xv + 657 pp. Fischer Verlag, Jena.

Novozhilov, N. 1964. Superfamily Plesiosauroidea. In: Orlov, J. A. (gen. ed.): Osnovy Paleontologii. Vol. 12, Amphibia, Reptilia, Aves (Rozhdestvenskiĭ, A. K. and L. P. Tatarinov,

eds.): 318–327. Nauka, Moscow (Russ.).

Oelrich, T. M. 1952. A new *Testudo* from the Upper Pliocene of Kansas with additional notes on associated Rexroad mammals. Trans. Kansas Acad. Sci. 55:300–311.

Oelrich, T. M. 1957. The status of the Upper Pliocene turtle, *Testudo turgida* Cope. J. Paleont. 31:228–241.

Olson, E. C. 1967. Early Permian Vertebrates. Oklahoma Geol. Surv. Circ. 74: 111 pp.

Olson, E. C. 1970. New and little known genera and species of vertebrates from the Lower Permian of Oklahoma. Fieldiana, Geol. 18:359–434.

Olson, E. C. 1984. The taxonomic status and morphology of *Pleuristion brachycoelus* Case; referred to *Protocaptorhinus pricei* Clark and Carroll (Reptilia: Captorhinomorpha). J. Paleont. 58:1282–1295.

Ostrom, J. H. 1970. Stratigraphy and paleontology of the Cloverly Formation (Lower Cretaceous) of the Bighorn Basin Area, Wyoming and Montana. Peabody Mus. Natur. Hist., Yale Univ., Bull. 35: viii + 1–234.

Panchen, A. L. 1970. Anthracosauria. In: Kuhn, O. (ed.). Handbuch der Paläoherpetologie. Vol. 5A: 84 pp. Fischer, Stuttgart.

Panchen, A. L. 1977. The origin and early evolution of tetrapod vertebrae. In: Andrews, S. M., Miles, R. S., and Walker, A. D. (eds.). Problems in vertebrate evolution. 289–318. Academic Press, London and New York.

Panchen, A. L. 1980. The origin and relationships of the authracosaur Amphibia from the Late Palaeozoic. In: Panchen, A. L. (ed.). The terrestrial environment and the origin of land vertebrates. Syst. Assoc. Spec. Vol. 15:. 319–350.

Peabody, F. E. 1951. The origin of the astragalus of reptiles. Evolution 5(4):339–344.

Peabody, F. E. 1952. *Petrolacosaurus kansenis* Lane, A Pennsylvanian reptile from Kansas. Univ. Kansas Paleont. Contr., Vertebrata, Art. 1:1–41.

Peabody, F. E. 1957. Pennsylvanian reptiles of Garnett, Kansas: *Edaphosaurus*. J. Paleont. 31:947–949.

Peabody, F. E. 1958. An embolomerous amphibian in the Garnett Fauna (Pennsylvanian) of Kansas. J. Paleont. 32:571–573.

Peyer, B. 1968. Comparative odontology. Translated and edited by R. Zangerl. i-xiv, 347 pp. Univ. Chicago Press, Chicago.

Piveteau, J. 1955. Squamata. In: Piveteau, J. (ed.): Traité de Paléontologie, Vol. 5, Amphibien, Reptiles, Oiseaux: 577–662. Masson, Paris.

Pregill, G. 1981. Late Pleistocene herpetofaunas from Puerto Rico. Univ. Kansas Mus. Natur. Hist. Misc. Publ. 71: 72 pp.

Preston, R. E. 1979. Late Pleistocene cold-blooded vertebrate faunas from the mid-continental United States. 1. Reptilia: Testudines, Crocodilia. Univ. Michigan Mus. Paleont., Pap. Paleont. 19:1–53 (C. W. Hibbard Memorial Vol. 6).

Preston, R. E., and C. J. McCoy, 1971. The status of *Emys twentei* Taylor (Reptilia: Testudinidae) based on new fossil records from Kansas and Oklahoma. J. Herpetol. 5:23–30.

Reisz, R. R. 1977. *Petrolacosaurus*, the oldest known diapsid reptile. Science 196, No. 4294: 1091–1093.

Reisz, R. R. 1981. A diapsid reptile from the Pennsylvanian of Kansas. Spec. Publ. Mus. Natur. Hist. Univ. Kansas 7:1–74.

Reisz, R. R., H. J. Heaton, and B. R. Pynn. 1982. Vertebrate fauna of Late Pennsylvanian Rock Lake Shale near Garnett, Kansas: Pelycosauria. J. Paleont. 56:741–750.

Rickart, E. A. 1976. A new horned lizard *(Phrynosoma adinognathus)* from the early Pleistocene of Meade County, Kansas, with comments on the herpetofauna of the Borchers locality. Herpteologica 32:64–67.

Riggs, E. S. 1944. A new polycotylid plesiosaur. Univ. Kansas Sci. Bull. 30:77–87.

Romer, A. S. 1933. Vertebrate paleontology. i-vii, 491 pp. Univ. Chicago Press, Chicago.

Romer, A. S. 1945. Vertebrate paleontology, 2nd ed. i-viii, 687 pp. Univ. Chicago Press, Chicago.

Romer, A. S. 1956. Osteology of the reptiles. 722 pp. Univ. Chicago Press, Chicago.

Romer, A. S. 1966. Vertebrate Paleontology, 3rd ed. i-viii, 468 pp. Univ. Chicago Press, Chicago.

Romer, A. S., and L. I. Price. 1940. Review of the Pelycosauria, Geol. Soc. Amer., Spec. Pap. 28: 538 pp.

Rowe, T., E. H. Colbert, and J. D. Nations. 1981. The occurrence of *Pentaceratops* (Ornithischia: Ceratopsia) with a description of its frill. In: Lucas, S. G., J. K. Rigby Jr., and B. S. Kuess (eds.): Advances in San Juan Basin Paleontology: p. 29–48. Univ. New Mexico Press, Albuquerque.

Russell, D. A. 1967. Systematics and morphology of American mosasaurs (Reptilia, Sauria). Peabody Mus. Natur. Hist., Yale Univ. Bull. 23:1–240.

Schmidt, K. P. 1927. New reptilian generic names. Copeia 163:58–59.

Schultz, G. E. 1965. Pleistocene vertebrates from the Butler Springs local fauna, Meade County, Kansas. Papers Michigan Acad. Sci., Arts, Letters 50:235–265.

Schultze, H.-P. 1985. Marine to onshore vertebrates in the Lower Permian of Kansas and their paleoenvironmental implications. Univ. Kansas Paleont. Contrib., Pap. 113:1–18.

Schultze, H.-P., and B. Foreman. 1981. A new gymnarthrid microsaur from the Lower Permian of Kansas with a review of the tuditanomorph microsaurs (Amphibia). Occ. Pap. Mus. Natur. Hist. Univ. Kansas No. 91:1–25.

Schultze, H.-P., and J. Chorn. 1983. A labyrinthodont palatine from the Permian of Fort Sill, Oklahoma, reinterpreted as a vomer. J. Paleont. 57:1050–1052.

Schultze, H.-P., J. D. Stewart, A. M. Neuner, and R. W. Coldiron. 1982. Type and Figured Specimens of Fossil Vertebrates in the Collection of the University of Kansas Museum of

Natural History. Part 1. Fossil Fishes. Univ. Kansas Mus. Natur. Hist. Misc. Publ. 73:1–53.

Shor, E. N. 1971. Fossils and Flies. The life of a compleat scientist, Samuel Wendell Williston (1851-1918). i-xiv + 285 pp. Univ. Oklahoma Press, Norman.

Snow, F. H. 1878. On the dermal covering of a mosasauroid reptile (*Liodon dyspelor* Cope.). Trans. Kansas Acad. Sci. 6:54–58.

Snow, F. H. 1880. [To the Board of Regents of the University of Kansas:]. Univ. Kansas Second Biennial Rep. 1879–1880:33–34.

Sternberg, C. H. 1909. The life of a fossil hunter. 286 pp. Henry Holt, New York.

Sternberg, C. H. 1931. The life of a fossil hunter. Second printing: 286 pp. Published by author.

Sukhanov, V. B. 1964. Subclass Testudinata. In: Orlov, J. A. (gen. ed.). Osnovy Paleontologii, Vol. 12: Amphibia, Reptilia, Aves (Rozhdestvenskiĭ, A. K., and L. P. Tatarinov, eds.): 354–438. Nauka, Moscow (Russ.).

Sullivan, R. M. 1979. Revision of the Paleogene genes *Glyptosaurus* (Reptilia: Anguidae). Bull. Amer. Mus. Natur. Hist. 163:1–72.

Sullivan, R. M. 1981. Fossil lizards from the San Juan Basin, New Mexico. In: Lucas, S. G., J. K. Rigby Jr., and B. S. Kuess. Advances in San Juan Basin paleontology: 76–88. Univ. New Mexico Press, Albuquerque.

Szarski, H. 1962. The Origin of the Amphibia. Quart. Rev. Biol. 37:189–241.

Tatarinov, L. P. 1964A. Order Plesiopoda. In: Orlov, J. A. (gen. ed.): Osnovy Paleontologii. Vol. 12: Amphibia, Reptilia, Aves (Rozhdestvenskiĭ, A. K., and L. P. Tatarinov, eds.): 123–124. Nauka, Moscow (Russ.).

Tatarinov, L. P. 1964B. Subclass Synaptosauria. In: Orlov, J. A. (gen. ed.): Osnovy Paleontologii, Vol. 12: Amphibia, Reptilia, Aves (Rozhdestvenskiĭ, A. K., and L. P. Tatarinov, eds.): 299–338. Nauka, Moscow (Russ.).

Taylor, E. H. 1937. Una nueva fauna de Batrachios anuros del Plioceno medio de Kansas. An. Inst. Biol. Univ. Nac. Mexico 7:513–529.

Taylor, E. H. 1938. A new anuran amphibian from the Pliocene of Kansas. Univ. Kansas Sci. Bull. 25:407–419.

Taylor, E. H. 1941A. Extinct lizards from Upper Pliocene deposits of Kansas. State Geol. Surv. Kansas Bull. 38:165–176.

Taylor, E. H. 1941B. Extinct toads and salamanders from Middle Pliocene beds of Wallace and Sherman Counties, Kansas. State Geol. Surv. Kansas Bull. 38:177–196.

Taylor, E. H. 1942. Extinct toads and frogs from the Upper Pliocene deposits of Meade County, Kansas. Univ. Kansas Sci. Bull. 28:199–235.

Taylor, E. H. 1943. An extinct turtle of the genus *Emys* from the Pleistocene of Kansas. Univ. Kansas Sci. Bull. 29:249–254.

Taylor, E. H. 1951. Concerning Oligocene Amphisbaenid reptiles. Univ. Kansas Sci. Bull. 34:521–578.

Tihen, J. A. 1958. Comments on the osteology and phylogeny of ambystomid salamanders. Bull. Florida State Mus., Biol. Sci. 3:1–50.

Tihen, J. A. 1960. On *Neoscaphiopus* and other Pliocene pelobatid frogs. Copeia 1960, No. 2:89–94.

Tihen, J. A. 1962. A review of New World fossil bufonids. Amer. Midland Naturalist 68:1–50.

Wagner, G. 1898. On some turtle remains from Ft. Pierre. Kansas Univ. Quart. 7:201–203.

Welles, S. P. 1943. Elasmosaurid plesiosaurs with description of new material from California and Colorado. Mem. Univ. California 13:125–254.

Welles, S. P. 1952. A Review of the North American Cretaceous elasmosaurs. Univ. California Publ. Geol. Sci. 29:47–144.

Welles, S. P. 1962. A new species of elasmosaur from the Aptian of Colombia and a review of the Cretaceous plesiosaurs. Univ. California Publ. Geol. Sci. 44:1–96.

Wellnhofer, P. 1978. Pterosauria. In: Wellnhofer, P. (ed.). Handbuch der Paläoherpetologie, Vol. 19: x + 1–82. G. Fischer, Stuttgart, New York.

Wells, C. 1964. Bones, bodies and disease. Evidence of disease and abnormality in early man. Thames and Hudson, London. 288 pp.

Whetstone, K. N. 1978. A new genus of cryptodiran turtles (Testudinoidea, Chelydridae) from the Upper Cretaceous Hell Creek Formation of Montana. Univ. Kansas Sci. Bull. 51:539–563.

Wieland, G. R. 1900. Some observations on certain well-marked stages in the evolution of the testudinate humerus. Amer. J. Sci., 4. Ser., 9: 413–424.

Williams, E. E. 1950. *Testudo cubensis* and the evolution of western hemisphere tortoises. Bull. Amer. Mus. Natur. Hist. 95:1–36.

Williams, R. B. 1975. Ancient life found in Kansas rocks. An introduction to common Kansas fossils. Kansas Geol. Surv., Educat. Ser. 1: 42 pp.

Williston, S. W. 1890A. Structure of the Plesiosaurian skull. Science 16(405):267.

Williston, S. W. 1890B. A new plesiosaur from the Niobrara Cretaceous of Kansas. Trans. Kansas Acad. Sci. 12:174–178.

Williston, S. W. 1892. Kansas pterodactyls. Part I. Kansas Univ. Quart. 1:1–13.

Williston, S. W. 1893A. Kansas pterodactyls. Part II. Kansas Univ. Quart. 2:79–81.

Williston, S. W. 1893B. Kansas Mosasaurs. Part II. Restoration of *Clidastes*. Kansas Univ. Quart. 2:83–84.

Williston, S. W. 1894A. On various vertebrate remains from the lowermost Cretaceous of Kansas. Kansas Univ. Quart. 3:1–4.

Williston, S. W. 1894B. A new turtle from the Benton Cretaceous. Kansas Univ. Quart. 3:5–18.

Williston, S. W. 1895A. New or little known extinct vertebrates. Kansas Univ. Quart. 3:165–176.

Williston, S. W. 1895B. Note on the mandible of *Ornithostoma*. Kansas Univ. Quart. 4:61.

Williston, S. W. 1896. On the skull of *Ornithostoma*. Kansas Univ. Quart. 4:195–197.

Williston, S. W. 1897A. Restoration of *Ornithostoma (Pteranodon)*. Kansas Univ. Quart. 6:35–51.

Williston, S. W. 1897B. A new plesiosaur from the

Kansas Comanche Cretaceous. Kansas Univ. Quart., Ser. A, 6:57.

Williston, S. W. 1897C. *Brachysaurus*, a new genus of mosasaurs. Kansas Univ. Quart., Ser. A, 6:95–98.

Williston, S. W. 1897D. On the extremities of *Tylosaurus*. Kansas Univ. Quart., Ser. A, 6:99–102.

Williston, S. W. 1897E. Range and distribution of the mosasaurs with remarks on synonymy. Kansas Univ. Quart., Ser. A, 6:177–189.

Williston, S. W. 1897F. A new labyrinthodont from the Kansas Carboniferous. Kansas Univ. Quart. 6:209–210.

Williston, S. W. 1897G. Restoration of Kansas Mosasaurs. Kansas Univ. Quart., Ser. A, 6:107–110.

Williston, S. W. 1898A. Crocodiles. Univ. Geol. Surv. Kansas 4, Paleont.: 75–78.

Williston, S. W. 1898B. Mosasaurs. Univ. Geol. Surv. Kansas 4, Paleont.: 83–221.

Williston, S. W. 1898C. Turtles. Introduction and *Dermatochelys*. Univ. Geol. Surv. Kansas 4:349–369.

Williston, S. W. 1898D. The Sacrum of *Morosaurus*. Kansas Univ. Quart., Ser. A, 7:173–175.

Williston, S. W. 1898E. Miocene edentates. Science 8:132.

Williston, S. W. 1899A. Some additional characters of the Mosasaurs. Kansas Univ. Quart., Ser. A, 8:39–41.

Williston, S. W. 1899B. Notes on the coraco-scapula of *Eryops* Cope. Kansas Univ. Quart., Ser. A, 8:185–186.

Williston, S. W. 1901A. The dinosaurian genus *Creosaurus*, Marsh. Amer. J. Sci., 4th Ser., 11:111–114.

Williston, S. W. 1901B. A new turtle from the Kansas Cretaceous. Trans. Kansas Acad. Sci. 17:195–199.

Williston, S. W. 1902A. On the hind limb of *Protostega*. Amer. J. Sci. 13:276–278.

Williston, S. W. 1902B. Restoration of *Dolichorhynchops osborni*, a new Cretaceous plesiosaur. Kanas Univ. Sci. Bull. 1:241–244.

Williston, S. W. 1902C. Notes on some new or little known extinct reptiles. Kansas Univ. Sci. Bull. 247–254.

Williston, S. W. 1903A. North American plesiosaurs. Pt. 1. Field Columbia. Mus. Publ. No. 73, Geol. Ser. 2:1–77.

Williston, S. W. 1903B. On the osteology of *Nyctosaurus (Nyctodactylus)* with notes on American Pterosaurs. Field Columbia Mus. Publ. 78, Geol. Ser. 2:125–163.

Williston, S. W. 1904. The temporal arches of the Reptilia. Biol. Bull. 7:175–192.

Williston, S. W. 1906. North American plesiosaurs: *Elasmosaurus*, *Cimoliasaurus*, and *Polycotylus*. Amer. J. Sci. 21:221–236.

Williston, S. W. 1908. North American Plesiosaur. *Trinacromerum*. J. Geol. 16:715–736.

Williston, S. W. 1910A. *Cacops*, *Desmospondylus*: New genera of Permian vertebrates. Bull. Geol. Soc. Amer. 21:249–284.

Williston, S. W. 1910B. New Permian reptiles; rhachitomous vertebrae. J. Geol. 18:590–594.

Williston, S. W. 1914. Water Reptiles of the past and present. i-vii + 251 pp. Univ. Chicago Press, Chicago.

Williston, S. W. 1916. Synopsis of some American Permo-carboniferous tetrapoda. Contrib. Walker Mus. 1:225–226.

Williston, S. W. 1925. The osteology of the reptiles. 1st ed. Harvard Univ. Press. Cambridge. 300 pp.

Williston, S. W., and E. C. Case. 1892. Kansas Mosasaurs, Part 1. Kansas Univ. Quart. 1:15–32.

Williston, S. W., and R. L. Moodie. 1913. New plesiosaurian genus from the Niobrara Cretaceous of Nebraska (Abstract). Bull. Geol. Soc. America 24:120–121.

Williston, S. W., and R. L. Moodie. 1917. *Ogmodius martinii*, a new plesiosaur from the Cretaceous of Kansas. Kansas Univ. Sci. Bull. 10:61–73.

Yakovlew, N. 1901. Restes d'un mosasaurien trouvé dans le Crétacé supérieur du Sud de la Russie. Bull. Com. Géol. (U.S.S.R.), St. Petersbourg 20:507–520. (Russ. with French summary).

Yakovlew, N. 1906. Notes sur les mosasauriens. Bull. Com. Géol. (U.S.S.R.), St. Petersbourg 24:135–152. (Russ. with French summary).

Yatkola, D. A. 1976. Fossil *Heloderma* (Reptilia: Helodermatidae). Occ. Pap. Mus. Natur. Hist. Univ. Kansas 51:1–14.

Zangerl, R. 1953A. The vertebrate fauna of the Selma Formation of Alabama. Pt. 3. The turtles of the family Protostegidae. Fieldiana, Geol. Mem. 3:61–133.

Zangerl, R. 1953B. The vertebrate fauna of the Selma Formation of Alabama. Pt. 4. The turtles of the family Toxochelyidae. Fieldiana, Geol. Mem. 3:135–277.

Zangerl, R., and R. E. Sloan. 1960. A new specimen of *Desmatochelys lowi* Williston. A primitive cheloniid sea turtle from the Cretaceous of South Dakota. Fieldiana Geol. 14: No. 2:7–40.

Zeller, D. E. (ed.). 1968. The stratigraphic succession in Kansas. Kansas Geol. Surv. Bull. 189:1–81.

Zittel, K. A. 1902. Text-book of Palaeontology (Trans. a. ed. by R. Eastman) 2:i-viii, 283 pp. Macmillan, New York.

Zittel, K. A. 1918. Grundzüge der Paläontologie (Paläozoologie). Vol. 2. Vertebrata. 3rd ed. iv + 675 pp. Oldenbourg, München.

Zittel, K. A. 1932. Text-book of Paleontology (Second English ed., revised with additions by A. S. Woodward) 2:xvii + 464 pp. Macmillan, London.

Zug, G. R. 1966. The penial morphology and the relationships of Cryptodiran turtles. Occ. Pap. Mus. Zool. Univ. Michigan 647:1–24.

APPENDIX

GENERA AND SPECIES LISTED